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NATIONAL DEFENSE UNIVERSITY

JOINT FORCES STAFF COLLEGE

JOINT ADVANCED WARFIGHTING SCHOOL



**REDEFINING JOINT FIRES SERVICE FUNCTIONS TO BETTER SUPPORT
JOINT FORCE OPERATIONS**

by

Stephen Andrew Wertz

Colonel/U.S. Army

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

This paper is entirely my own work except as documented in footnotes.

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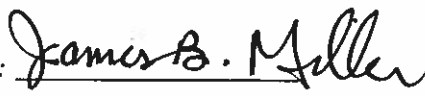
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ABSTRACT

The decisions made in the National Security Act of 1947, and the service functions assigned in Executive Order 9877, forced the Army and Air Force to become interdependent when planning and executing fires. The Air Force is the primary executor of operational and tactical aerial fires in support of the Army, while the Army is the primary executor of ground-based air and missile defense fires in support of Air Force-led theater air missile defense operations.

This thesis is a fundamental examination of the Army-Air Force service functions involved in planning and executing fires. The service functions assigned in 1947 were based largely on the domains in which the services operated. These functions remain largely unchanged today. In the offensive fires arena, the Air Force has provided outstanding operational fire support to the joint force and the Army since 1947. However, service disagreements and shortcomings at the tactical level have occurred. In the defensive fires arena, the Air Force's ability to establish air superiority has moved the Army's contribution to primarily missile defense, and has thrust the Army into the operational-level air superiority domain led and orchestrated by the Air Force.

This research shows that service worldviews have shaped the way each service approaches both offensive and defensive fires, and finds there is a mismatch in the assignment of service functions and the stated visions and core competencies of the two services. Based on this research, the author recommends numerous changes to the fires-related service functions, and subsequent force structures, to better align each service with their stated visions and core competencies in order to provide more effective fires in support of joint force operations.

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INTRODUCTION

The National Security Act of 1947 established the independent U.S. Air Force (AF) and Executive Order 9877 broadly defined armed service functions.¹ There was a great deal of consternation, politicking, and fighting among the services between 1945 and 1947 in determining what these functions would be. The leadership of each service participated in numerous working groups, political leadership provided input and guidance, and the president even became personally involved in providing direction. Two primary areas of debate were aviation and air defense. The AF argued for control of all aviation assets and units involved in establishing air superiority, while the Army was insistent that they maintain the ground-based air defense function.²

Ultimately decisions were made and functions were assigned. The AF was assigned strategic air functions, was directed to provide tactical air support for the Army, and was charged with coordination of all air defense operations. The Army was given responsibility for ground-based air defense.³ The result of the 1947 National Security Act and Executive Order 9877 was that the Army and AF became interdependent. Numerous revisions have been conducted since then. However, the basic tenants of the order remain in effect today.

¹ The National Security Act of 1947 and Executive Order 9877 were both signed on July 26, 1947. NSA 1947 organized the new Department of Defense and its major components. EO 9877 assigned functions to each of the services.

² Warren A. Trest, *Air Force Roles and Missions: A History* (Washington D.C.: Air Force History Office and Museums Program, 1998), 19-20.

³ Richard I. Wolf, "Executive Order 9877. Functions of the Armed Forces," in *The United States Air Force: Basic Documents on Roles and Missions* (Washington D.C.: Air Force History Office and Museums Program, 1987), 87-90.

Nowhere have service functions had a greater impact than in the area of fires. From 1947 onward, Army and AF commanders have had to coordinate between services to plan and execute fires. At the operational level the AF provides joint force commanders (JFC) with strategic attack, air interdiction (AI), and offensive and defensive counterair. The Army contributes to operational fires by executing long-range missile fires and ground-based air and missile defense (AMD) fires. At the tactical level Army commanders request, coordinate and synchronize close air support (CAS) with the AF.

The purpose of this thesis is to show that a misalignment exists in the fires-related functions assigned to the two services based on their core competencies and worldviews of warfighting. In conducting this examination, the author will review the fires lessons of recent history, the fires successes of the U.S. Marine Corps, and the different service cultures and worldviews of the Army and AF to show that adjustments in fires-related service functions, and subsequent force structures, are necessary in order to maximize the joint force commander's ability to execute operational and tactical fires.

The author realizes that many disciplines are involved in fires. For the sake of focus, non-lethal fires will not be discussed in this paper.⁴ Because the focus of this paper is joint fires, internal, component fires such as field artillery and mortar support to tactical army units, will be discussed only as they relate to joint, cross component fires.

⁴ Non-lethal fires are any fires that do not directly seek the physical destruction of the intended target and are designed to impair, disrupt, or delay the performance of enemy forces, functions, or facilities, or to alter the behavior of an adversary. Examples include masking smoke, nighttime area illumination, area denial, and employment of some information operations (IO) capabilities, such as electronic attack (EA) and computer network attack (CNA), that deceive the enemy, disable the enemy's C2 systems, and disrupt operations. U.S. Joint Chiefs of Staff, *Joint Fire Support*, Joint Publication 3-09 (Washington DC: Joint Chiefs of Staff, June 30, 2010), I-5.

The author also recognizes that the Navy and the Marine Corps execute fires. However, due to the missions they execute and the make-up of these services, the preponderance of their fires are self-contained. Even though the Navy and Marine Corps do provide the Joint Force Air Component Commander (JFACC) with assets to utilize in theater-level air operations, these platforms are utilized and controlled by the JFACC, usually an AF-led component. The Army and the AF are the two services that require interdependence in both the offensive and defensive fires arenas. Thus, they will be the primary focus of this paper.

This paper does not espouse the opinion that the establishment of the independent AF was a mistake. As the research will show the AF has provided our nation, and JFCs, with a strategic/operational capability that no other nation in the world possesses and has proved its metal during numerous conflicts over the past sixty-four years. Besides excelling in the operational fires arena, the U.S. Air Force has provided unparalleled contributions and capabilities in the air mobility, intelligence, surveillance, and reconnaissance (ISR), and space arenas. As evidenced by these contributions, the AF has established itself as a service equal to the others and provides a decisive advantage during peacetime and wartime.

This paper also does not espouse the view that the Army and AF need to work more diligently at being interdependent to successfully execute joint, cross-component fires. This is an opinion that has been promulgated by numerous experts in the joint fires community over the years. This paper goes a step further than that. This is a fundamental reexamination of Army and AF functions as they pertain to joint fires. Based on the decisions made sixty-four years ago, the two services have been attempting to make this

arrangement work. Since that time each of the services has evolved and established their own doctrine, tactics, techniques, and procedures. Often these methods of operating have been developed with primarily service interests and operations in mind. This method of operating has often resulted in poor results on the battlefield. This paper ultimately provides recommendations on how to correct this and improve fires execution in order to ensure JFCs receive timely and accurate operational and tactical fire support.

CHAPTER 1: FIRES

Fires Defined

JP 3-09 defines fires as “the use of weapon systems to create a specific lethal or nonlethal effect on a target. All fires are normally synchronized and integrated to achieve synergistic results. Fires can be delivered by air, land, maritime, or special operations forces (SOF).”¹ JP 3-09 goes on to define joint fires as “fires delivered during the employment of forces from two or more components in coordinated action to produce desired effects in support of a common objective.”² JP 3-09 emphasizes the importance of joint fires in the execution of joint operations, through its definition of joint fire support. “Joint fire support is defined as joint fires that assist air, land, maritime, and SOF to move, maneuver, and control territory, populations, airspace, and key waters in support of the joint force commander’s scheme of maneuver.”³

Individual services also emphasize the importance of fires as a critical warfighting function. The Army defines fires as “the lethal and non-lethal effects of weapons.”⁴ The Army recently published a new version of FM 3-09 Fire Support. In this document, the fires warfighting function is “the related set of tasks and systems that provide the collective and coordinated use of Army indirect fires, air and missile defense (AMD), and joint fires, through the targeting processes.”⁵ Within the Army fires warfighting function

¹ U.S. Joint Chiefs of Staff, *Joint Fire Support*, Joint Publication 3-09 (Washington DC: Joint Chiefs of Staff, June 30, 2010), I-1.

² Ibid., I-2.

³ Ibid.

⁴ Department of the Army, *Operational Terms and Graphics*, Field Manual 1-02 (Washington DC: Department of the Army, September 2004), 1-79.

⁵ Department of the Army, *Fire Support*, Field Manual 3-09 (Washington DC: Department of the Army, November 3, 2011), 1-3.

are offensive fires (Army indirect fires, joint fires, EA) and defensive fires (AMD, joint fires).⁶

The Air Force generally uses the definition of joint fires found in JP 3-09, but does not specifically use the term fires in defining its internal operations. Instead, the AF emphasizes functions and effects.⁷ Effects are “the physical or behavioral state of a system that results from an action, a set of actions, or another effect.”⁸ The AF performs functions to achieve effects. The AF core functions performed to achieve fires-related effects are categorized under global precision attack and air superiority. Global precision attack includes strategic attack, air interdiction (AI) and close air support (CAS). Air superiority includes offensive counterair (OCA) and defensive counterair (DCA).⁹

Taking into account both joint and service definitions and concepts, fires encompass achieving effects, are both offensive and defensive, and are delivered from air, land, and maritime platforms.

Fires are executed at all levels of war. Unfortunately, no adequate definition exists for operational fires in joint and service publications. Both the Army and AF view

⁶ Ibid.

⁷ Robert Novotny, *Defining Operational Fires* (Newport, RI: U.S. Naval War College, February 13, 2006), 5-6. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA463900&Location=U2&doc=GetTRDoc.pdf> (accessed January 6, 2012).

⁸ U.S. Air Force, *Air Force Basic Doctrine*, Air Force Doctrine Document 1 (Washington DC: U.S. Air Force, October 14, 2011), 131.

⁹ Ibid., 45-49. Strategic Attack: offensive action specifically selected to achieve national strategic objectives. These attacks seek to weaken the adversary's ability or will to engage in conflict, and may achieve strategic objectives. Air Interdiction: air operations conducted to divert, disrupt, delay, or destroy the enemy's military potential before it can be brought to bear effectively against friendly forces, or to otherwise achieve JFC objectives. Air interdiction is conducted at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required. Close Air Support: air action by fixed- and rotary-winged aircraft against hostile targets that are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces. Offensive Counterair: offensive operations to destroy, disrupt, or neutralize enemy aircraft, missiles, launch platforms, and their supporting structures and systems both before and after launch, but as close to their source as possible. Defensive Counterair: all the defensive measures designed to detect, identify, intercept, and destroy or negate enemy forces attempting to penetrate or attack through friendly airspace.

operational fires as fires in the deep area of the battlefield executed to support decisive operations. The AF states that operational fires are usually executed forward of the Fire Support Coordination Line (FSCL).¹⁰ While operational fires many times do occur in the “deep areas” of the battlefield, the Army and AF definitions are incomplete. Thus, this paper will utilize Lt. Col. Robert Novotny’s definition as described in his Naval War College thesis entitled “Defining Operational Fires.”

The goal of operational fires is to shape the battlefield or the entire area of operations by accomplishing operational-level effects. Operational activities such as maneuver or tactical actions may see the benefit of operational fires. Operational fires can exist as a stand-alone function for the Joint Force Commander or they may support a main effort. Operational fires can occur anywhere within the Joint Operating Area (JOA) and may be delivered via a variety of platforms, weapon systems or personnel.¹¹

Lt. Col. Novotny accurately states that operational fires are used to shape the battlefield, or area of operations, and achieve operational-level effects. Based on this definition the AF contributes to operational fires through AI, strategic attack, and offensive and defensive counterair. The Army contributes to operational fires through long-range missile and AMD fires.¹²

There is also no joint or service definition for tactical fires. As such, this paper modifies Lt. Col Novotny’s definition of operational fires to the tactical level of war. Tactical fires are thus, fires in support of tactical level operations that achieve tactical level effects. Tactical fires include artillery and mortar fires, tactical level air defense

¹⁰ Novotny, *Defining Operational Fires* , 5-6.

¹¹ Ibid., 15.

¹² Robert J. D’Amico, “Joint Fires Coordination: Service Competencies and Boundary Challenges,” *Joint Forces Quarterly*, no. 21 (Spring 1999): 71, <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA525517&Location=U2&doc=GetTRDoc.pdf> (accessed January 6, 2012).

fires, and CAS. AI may be executed at the tactical or operational level based on the objective of the mission.

Fires in Support of Joint Force Command Operations

JFCs require effective offensive and defensive fires to ensure they achieve operational objectives. They require offensive fires to shape the operational environment and ensure freedom of maneuver for the joint force. They require defensive fires to protect the force. The JFC, using systems that allow rapid response to changes as they occur, is responsible for ensuring the synchronization and integration of joint fires. The challenge for the JFC is to integrate and synchronize the wide range of capabilities at his disposal.¹³

Although the JFC does have a fires cell, he relies heavily on the Joint Force Air Component Commander (JFACC) for planning, executing, and synchronizing fires within the JOA. The JFACC is the air commander with the preponderance of air assets in theater and possesses the capability to command and control (C2) theater air operations.¹⁴ Based on this, the JFACC normally comes from the AF.

JFACC responsibilities are numerous but include recommending the proper employment of air and space forces from multiple components. The JFACC also plans, coordinates, tasks, executes, and assesses air and space operations to accomplish assigned operational missions. Due to the theater-wide scope of air and space operations, the JFACC will typically maintain the same JOA/theater-wide perspective as the JFC.¹⁵ The JFACC is normally appointed as the theater Area Air Defense Commander (AADC) and

¹³ JCS, *Joint Fire Support*, JP 3-09, I-3.

¹⁴ U.S. Air Force, *Air Force Basic Doctrine*, Air Force Doctrine Document 2 (Washington DC: U.S. Air Force, April 3, 2007), 39.

¹⁵ Ibid.

the Airspace Control Authority (ACA) since he commands the majority of the air defense assets and airspace users. As the AADC, the JFACC commands, controls, and integrates theater air missile defense (TAMD) operations. As the ACA, he synchronizes and oversees JFC airspace operations and integrates all component airspace users into JFC operations. In executing these duties, the JFACC establishes and oversees the Theater Air Control System (TACS).¹⁶

Since the JFACC commands and directs the majority of the operational level offensive and defensive fires assets within the JOA, and oversees theater airspace operations, he becomes in essence, the JFC's fire support coordinator. In executing these duties, the JFACC operates from the Joint Air Operations Center (JAOC). The JAOC staff develops and executes daily air battle plans (ABP) that support JFC objectives and key tasks. The JAOC staff plans and executes strategic attack, operational-level ISR, OCA, DCA and AI. During major combat operations, the JFACC is usually the supported command for theater air interdiction and counterair/air missile defense.¹⁷ Based on the tasks and missions the JFACC executes, his focus is primarily at the operational level.

In major combat operations, the Army component commander is often assigned as the Joint Force Land Component Commander (JFLCC) since the Army normally possesses the preponderance of forces within a JFLCC Area of Operations (AO). The JFLCC develops operational maneuver objectives that support JFC theater objectives. Subordinate units develop and execute collective, tactical tasks, at each echelon, in order

¹⁶ TACS provides the COMAFFOR with an overarching means of commanding and controlling counterair operations. It includes the personnel, procedures, and equipment, such as the AOC, necessary to plan, direct, control, and assess air operations and to coordinate those operations with other components. USAF, *Counterair Operations*, AFDD 2-1.1, 11-14.

¹⁷ USAF, *Air Force Basic Doctrine*, AFDD 2, 40-41.

to achieve JFLCC operational objectives.¹⁸ As such, the Army's primary focus is at the tactical level.

In the fires arena, the same holds true. The Army does coordinate AI requests through liaisons at the JAOC in order to defeat enemy forces and capabilities prior to engaging them.¹⁹ However, the primary focus of Army fires is in support of tactical level operations. Fire support teams and fires cells from company to division level coordinate, synchronize, and execute fires delivery from field artillery cannon and rocket platforms, mortars, rotary-wing aviation, and fixed-wing close air support against targets that are usually in close contact with friendly Army forces.²⁰ The Army's fires command and control apparatus is focused on, and set up to oversee, tactical-level fires.

In order for JFCs to successfully execute operations, it is imperative that they successfully employ fires throughout the formation. Since 1947, JFCs have overseen a fires apparatus that relies heavily on Army-AF interdependence and cooperation. In the upcoming chapters we will examine how fires roles, missions, and functions originated, the numerous debates that have ensued since their establishment, and how well U.S. forces have executed fires under this structure.

¹⁸ U.S. Joint Chiefs of Staff, *Command and Control for Joint Land Operations*, Joint Publication 3-31 (Washington DC: Joint Chiefs of Staff, June 29, 2010), II-2.

¹⁹ JCS, *Joint Fire Support*, JP 3-09, II-7.

²⁰ U.S. Army, *Fire Support*, FM 3-09, 2-2 – 2-5.

CHAPTER 2: OFFENSIVE FIRES HISTORICAL REVIEW

Establishing Service Functions for Fires

In accordance with Title 10, United States Code (USC), Section 153 (b), the Chairman of Joint Chiefs of Staff (CJCS) must review service roles, missions, and functions every three years. Admiral Crowe, the first CJCS to conduct such a review defined roles, missions, and functions in terms that are still accepted today.¹

- **Roles** are the broad and enduring purposes for which the Services and U. S. Special Operations Command were established by law.²

- **Functions** are the appropriate or assigned duties, responsibilities, missions, or tasks of an individual, office, or organization as defined in the National Security Act of 1947, including responsibilities of the Armed Forces as amended. The term “function” includes purpose, powers, and duties. Specific Functions of the Services and U.S. Special Operations Command are captured in Department of Defense Directives.³

- **Missions** are broad enduring purposes that the President or the Secretary of Defense assigns to Commanders-in-Chief of US combatant commands.⁴

Over the years, numerous pieces of legislation have helped frame service roles, missions, and functions. Today the primary legislation that is used consists of three documents: 1) Title 10, USC; 2) Department of Defense Directive 5100.01, Functions of the Department of Defense and Its Major Components; and 3) the Goldwater-Nichols Department of Defense Reorganization Act of 1986. Title 10 defines service roles and missions. DOD Directive 5100.01 defines contemporary functions of each service.

Goldwater-Nichols underscores the importance of joint training, education, doctrine and

¹ Congressional Research Service, *Military Roles and Missions: A Framework for Review*, by the Congressional Research Service, Senate Print 95-517 (Washington DC: Government Printing Office, 1995), 1-7.

² Department of Defense, *Quadrennial Roles and Missions Review Report*, (Washington DC: Department of Defense, January 2009), 4.

³ Ibid.

⁴ William J. Crowe. *Roles and Functions of the Armed Force*, A Report to the Secretary of Defense (Washington, DC: Office of the Chairman of the Joint Chiefs of Staff, 1989), Appendix C.

operations.⁵ “Functions” is the most accurate term to describe the tasks services are required to perform. However, the terms “roles and missions” became popular during the debates leading up to 1947. Thus, these are the terms most popularly associated with the tasks each service is statutorily required to execute.

Since the establishment of the independent U.S. Air Force in the National Security Act of 1947, and the subsequent issuance of service functions in Executive Order 9877, the single biggest source of tension between the Army and the AF has been the role of the AF in providing fires (primarily close air support (CAS) in support of the Army. Since 1947, service interests and funding concerns have played a greater role in determining “who does what” than effective warfighting in support of JFCs. Both the Army and the AF have spoken out of both sides of their mouth on this issue. The AF has stated that tactical aerial fires is their role, and has been vocal in their arguments against the Army acquiring and employing capabilities that could perform it. However, they have underfunded tactical programs and generally placed tactical fires in a second-tier status. The Army, on the other hand, has complained vigorously about the lack of emphasis the AF places on tactical fires. However, when opportunities to alter service functions that would allow them to execute CAS arose, they demurred and said they wanted the AF to continue to execute tactical aerial fires. In essence, the Army has stated “we don’t want to do it; we want the AF to do it, and do it better.”

During the armed forces organizational discussions of 1945-1947, GEN Dwight Eisenhower was one of the biggest proponents for establishing an independent AF. He had seen the effectiveness of air power at all levels during WWII and believed the time

⁵ Congressional Research Service, *Military Roles and Missions: A Framework for Review*, by the Congressional Research Service, Senate Print 95-517 (Washington DC: Government Printing Office, 1995), 1.

had come for a separate air arm. However, he did want assurances that the AF would continue to dedicate sufficient resources to provide the Army tactical fires.⁶ After much debate, the National Security Act of 1947 codified the modern U.S. armed forces organization. Executive Order 9877 established AF functions as:

All military aviation, combat and service, not otherwise assigned. Specific USAF functions were: air operations including joint operations; gaining general air supremacy; establishing local air superiority; responsibility for the strategic air force and strategic air reconnaissance; airlift and support for airborne operations; air support to land and naval forces, including support of occupation forces; and air transport except for that furnished by the Navy.⁷

The order further charged the AF with supplying the means to coordinate air defense among the services.⁸ The functions of the Army were “to organize, train, and equip land forces for operations on land, including joint operations; seizure or defense of land areas, including airborne and joint amphibious operations; and occupation of land areas.”⁹

Air Force Chief of Staff, Gen Carl Spaatz, organized the new AF under three commands: tactical air command (TAC), strategic air command (SAC), and air defense command (ADC). He received a great deal of criticism for this. Many AF leaders believed he was simply appeasing GEN Eisenhower, and selling out on the original AF vision. Leaders such as Gen George Kenney, the first SAC commander, stated, “I think we are cutting ourselves into two camps that are liable to be gobbled up...I don’t think that an airplane should be considered as a tactical airplane and a strategic airplane,”

⁶ Herman S. Wolk, *Planning and Organizing the Postwar Air Force* (Washington DC: Air Force History Office, 2002), 164-167.

⁷ Richard I. Wolf, “Executive Order 9877: Functions of the Armed Forces,” In *The United States Air Force: Basic Documents on Roles and Missions* (Washington D.C.: Air Force History Office and Museums Program, 1987), 89-90.

⁸ Ibid., 90.

⁹ Ibid., 87-90.

Kenney argued, “I think it is an airplane.”¹⁰ Lieutenant General Elwood Quesada, the first TAC commander, agreed in principle but thought that without the distinction, the Army might try to demand its own tactical air forces on the same grounds that the Navy had kept its carrier-based forces.¹¹

Soon after the new legislation was enacted, each of the services began to have second thoughts. The original functions outlined in Executive Order 9877 lacked clarity and fostered disunity, especially regarding the Army’s role in aviation. To remedy the situation, DOD leaders met in 1948 to attempt to further refine service functions. The resulting “Functions of the Armed Forces and the Joint Chiefs of Staff,” replaced Executive Order 9877 and reaffirmed the Army’s responsibility for land warfare and the AF’s responsibility for war in the air, including strategic air operations and air defense of the U.S. The Army was allowed to retain a few spotter and liaison aircraft. However, the AF was given primary responsibility for providing “close combat and logistical air support to the Army to include airlift, support and resupply of airborne operations, aerial photography, tactical reconnaissance, and interdiction.”¹² Although given primary responsibility for tactical fires in support of the Army, during the resource constrained post-war period, the newly formed AF underfunded both TAC and ADC to support SAC. This alarmed many in the Army and would have serious consequences in the upcoming years.¹³

¹⁰ Warren A. Trest, *Air Force Roles and Missions: A History* (Washington D.C.: Air Force History Office and Museums Program, 1998), 114.

¹¹ Ibid.

¹² Wolk, *Planning and Organizing the Postwar Air Force*, 220.

¹³ Trest, *Air Force Roles and Missions: A History*, 114.

Korea

Operations in Korea provided an immediate test for the new U.S. defense organization. The results were mixed, with neither service being satisfied. At the time operations in Korea were initiated, the AF was primarily focused on its nuclear, strategic mission and failed to train with Eighth US Army to provide tactical air support. The number of forward air controllers deployed to Korea was minimal, and they deployed with inadequate equipment to control aircraft.¹⁴ The AF did provide effective fires in support of Eighth Army, especially during the Pusan perimeter defense and later during static operations along the 38th parallel. However, most of these fires came in the form of AI, with Eighth Army relying almost entirely on its organic artillery fires for close support.¹⁵ This lack of adequate CAS continued for the entirety of the Korean conflict; additionally, the Army and AF never established a satisfactory method for executing emergency CAS.¹⁶

The situation with the Marines in Korea was diametrically opposite to that of the Army and AF. Due in large part to the organic air the Marines possessed, they were well-trained and well-versed in executing CAS. This resulted in much more timely and effective CAS.¹⁷ In fact, Marine aviation provided Army units involved in the defense of the Pusan perimeter and the Inchon landings with dedicated CAS. Army leaders liked what they saw, and recommended that CAS aircraft be allocated to each Army division.¹⁸

¹⁴ Robert F. Futrell, *The United States Air Force in Korea*, Revised Edition (Washington DC: Office of Air Force History, 1983), 80.

¹⁵ *Ibid.*, 261.

¹⁶ James A. Field, *History of United States Naval Operations Korea* (Washington DC: Government Printing Office, 1962), 455.

¹⁷ Richard P. Hallion, *The Naval Air War in Korea* (Baltimore, MD: The Nautical & Aviation Publishing Company, 1986), 42-46.

¹⁸ Futrell, *The United States Air Force in Korea*, 80.

However, AF insistence on centralizing air assets to maintain maximum flexibility ultimately prevented this from occurring.¹⁹

Throughout the Korean campaign the AF insisted that strategic bombing operations against China could be decisive. GEN Douglas MacArthur argued for these operations as well. However, U.S. political considerations prevented this from occurring.²⁰ Thus, AF continued focus on strategic operations during what became primarily a tactical campaign led the Army to feel it had been abandoned.²¹ As the services exited Korea, much work remained to be done in the tactical joint fires arena to realize the vision of true interdependence.

While operations in Korea were ongoing, debates between the Army and AF continued over the role of aviation in the services. The central topic in these debates was the Army's desire to acquire and utilize helicopters. Numerous agreements were established, and subsequently altered in the early 1950s, until ultimately Secretaries Frank Pace (USA) and Thomas Finletter (USAF) signed a Memorandum of Agreement (MOA) establishing the ground rules for rotary-wing aviation. The Army interpreted this MOA as free rein to develop and begin employing helicopters. They did so, and ultimately twelve helicopter battalions were deployed and utilized in Korea.²²

Exiting Korea, the primary service functions debate returned to AF tactical fires in support of the Army. Newly appointed Army Chief of Staff GEN Matthew Ridgeway argued passionately for greater organic air support capability. The Army felt it had been

¹⁹ Ibid., 49.

²⁰ Trest, *Air Force Roles and Missions: A History*, 141-146..

²¹ Ian Horwood, *Interservice Rivalry and Airpower in the Vietnam War* (Fort Leavenworth, KS: Combat Studies Institute Press, 2006), 18-19.

²² Trest, *Air Force Roles and Missions: A History*, 149.

wronged by the AF's failure to meet the needs of ground soldiers. GEN Ridgeway did not oppose the administration's emphasis on air power. However, he deeply resented what he felt was an overemphasis on the strategic bomber. He stated the AF showed little interest in developing "low and slow" platforms needed by the Army, and believed the Army would need to begin filling this void. Under GEN Ridgeway's direction, the Army began to explore the development of fixed-wing aircraft and helicopters, to include gunships, to meet Army fires requirements.²³

In spite of the Army's protests, the AF, based on the nation's nuclear defense strategy, continued along its strategic-first path during and after the Korean campaign. TAC was underfunded and ultimately subsumed by Continental Air Command two years after its origination, and all four editions of AFM1-2 published in the 1950s reflect the service's continued emphasis on strategic operations.²⁴

In 1955, the Army's new Chief of Staff, GEN Maxwell Taylor continued the drumbeat for the Army's acquisition of aerial fires platforms. Under GEN Taylor the Army began a five-year plan to develop fixed-wing and rotary-wing aviation platforms, independent of the AF. He also established and appointed the first Army director of aviation. Although the Army began planning for development of armed aircraft, service function debates and fiscal realities confined most Army aviation developments in the 1950s to rotary-wing platforms.²⁵

²³ Matthew B. Ridgway and Harold H. Martin, *Soldier: The Memoirs of Matthew B. Ridgway* (Westport, CT: Greenwood Publishing Group, 1974), 312.

²⁴ David P. Handel, *The Evolution of United States Air Force Basic Doctrine* (Maxwell AFB, AL: U.S. Air University, 1978), 37-40.

²⁵ Trest, *Air Force Roles and Missions: A History*, 173.

Entering the 1960s, the service functions debate surrounding aerial fires intensified with the Army continuing to complain of a lack of AF support. The AF countered by campaigning aggressively for sole employment of air power. In 1961 the new AF Chief of Staff, Gen Curtis LeMay began meeting with the Army Chief of Staff, GEN Earle Wheeler, to suggest that the best, most cost effective way to employ an air-ground team was for the AF to perform all air tasks. Based on the AF performance of the previous decade, he was rebuffed by GEN Wheeler. Throughout Gen Lemay's tenure as AF Chief, the Army warded off continual efforts by the AF to take over all air operations. Gen LeMay's belief was that the AF should operate "everything that flies, down to the last puddle jumper."²⁶ He did his best to make this happen.

Despite Gen LeMay's best efforts, the Army found an ally in the debate in Secretary of Defense Robert McNamara. Early in his tenure, McNamara allowed the Army to continue its helicopter development.²⁷ Based on these developments and the new administration's focus on counterinsurgency operations, the AF began to relook their stance on tactical fires, and ultimately agreed to place more emphasis on tactical air support. Despite a public AF commitment to tactical air support, the Army of the early-mid 1960s was still not satisfied with the level of support and continued to argue against centralized control of air power.²⁸

Vietnam

With the commitment of major U.S. forces in Vietnam in the mid-1960s the debate between the services over the role of aerial fires persisted. The AF argued for a

²⁶ Ibid., 195.

²⁷ Robert A. Olson, "Air Mobility for the Army," *Journal of Military History*, vol 28, no. 4 (Washington DC: Government Printing Office, 1965): 169.

²⁸ Trest, *Air Force Roles and Missions: A History*, 193.

strategic campaign in North Vietnam that would largely eliminate the need for large scale ground operations.²⁹ Based on restrictions imposed by Washington D.C. and the failed strategy of “graduated response”, initial strategic attack operations were largely indecisive.³⁰

During Vietnam the issue of centralized control of air power once again came to the forefront. The AF insisted on centralized control of all air assets operating in theater under 7th AF (initially 2nd Air Division). This resulted in numerous debates, especially with the Marine Corps. The AF insisted that centralized control allowed for maximum flexibility of air employment in support of ground forces. Marines argued that they trained as an air-ground team and they would fight this way. The Army agreed with the Marines and argued for dedicated fixed-wing support.³¹

Ultimately, 7th AF did centrally control all fixed-wing aircraft that supported the Army, and at times controlled Marine aircraft. The Army argued that the nature of the conflict necessitated a rapid response that the centrally controlled system failed to facilitate. To fill this capability gap the Army began employing armed helicopters in the CAS role.³²

The employment of armed helicopters initiated a new set of debates between the services. The AF argued once again that employing armed helicopters in the CAS role violated the Army’s functions as established in the 1947 National Security Act and

²⁹ Marvin E. Gettleman, *Vietnam: History, Documents, and Opinions on a Major World Crisis* (Greenwich, CT: Fawcett Publications, 1965), 284-316.

³⁰ W. Momyer, *Air Power in Three Wars* (Maxwell AFB, AL: U.S. Air University, 17-20), 118.

³¹ Horwood, *Interservice Rivalry and Airpower in the Vietnam War*, 64-86.

³² Scott A. Hasken, *A Historical Look at Close Air Support* (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 2003), 35. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA416360> (accessed January 6, 2012).

subsequent CAS agreements in 1952 and 1957.³³ They also argued that helicopters should fall under the control of the Theater Air Component Commander in the Theater Air Control System (TACS).³⁴ The Army argued that it was a capability they required and the AF was not providing it to a sufficient degree. Ultimately the issue was resolved between service chiefs, as the Johnson-McConnell Agreement in 1966 traded the Army's fixed-wing airlift mission to the AF in exchange for the Army's ability to employ helicopters in a fire support role.³⁵ To sidestep the service functions debate the Army referred to helicopter based fire support as "direct aerial fire support."³⁶ However, this term was a ruse. Conceptually, and in practice, it was close air support.

Using helicopters in the CAS role made Army commanders comfortable because they were dedicated to supporting their missions and were involved in their planning processes. Army commanders quickly put helicopters to work in order to avoid what they perceived as the cumbersome process of requesting and employing AF fixed-wing assets.³⁷ In fact, the preeminent technique for employment of fire support used by the Army was to employ artillery and/or rotary-wing CAS because of their rapid response times and understanding of the operations. They would then employ fixed-wing CAS when it arrived on scene.³⁸

³³ John Sbrega, "Southeast Asia," in *Case Studies in the Development of Close Air Support*, ed. Benjamin Franklin Cooling (Washington, DC: Office of the Air Force History United States Air Force, 1990) 455. <http://www.afhso.af.mil/shared/media/document/AFD-100924-035.pdf> (accessed January 6, 2012).

³⁴ Horwood, *Interservice Rivalry and Airpower in the Vietnam War*, 74.

³⁵ Frederic Bergerson, *The Army gets an Air Force: Tactics of Insurgent Bureaucratic Politics* (Baltimore: The Johns Hopkins University Press, 1980), 117.

³⁶ *Ibid.*, 137.

³⁷ Sbrega, "Southeast Asia," in *Case Studies in the Development of Close Air Support*, 454.

³⁸ Horwood, *Interservice Rivalry and Airpower in the Vietnam War*, 129.

After several years in Vietnam tactical-level air operations did improve through the use of Airborne Forward Air Controllers and pre-planned CAS requests that provided Army units near-constant overhead cover.³⁹ The AF also began effectively employing strategic assets, such as the B-52, in CAS roles. Finally, the AF began developing aircraft, such as the AC-130 and A-10, specifically to provide tactical level fire support.⁴⁰ However, arguments continued throughout the conflict over the role of rotary-wing aircraft and the means of controlling CAS.

Operational-level air operations in Vietnam were severely restricted by Washington's policy of graduated response and their efforts to limit the scope of the conflict. The effectiveness of operational fires, such as strategic attack and AI, must be viewed through this lens. However, when restrictions were reduced, they were effective. This was especially so during the interdiction of the Ho Chi Minh trail in the late-1960s/early 1970s and during the LINEBACKER strategic attack operations in the early 1970s.⁴¹ The totality of tactical offensive fires was much improved from Korea. However, this occurred largely over time, as the services worked together to develop effective tactics, techniques and procedures. It also occurred based on the introduction of the helicopter as a fire support platform, and the integration of the helicopter with field artillery and fixed-wing close air support.

³⁹ Ibid., 128.

⁴⁰ Richard I. Wolf, *The United States Air Force: Basic Documents on Roles and Missions* (Washington, DC: Office of Air Force History, 1987), 379-384.

⁴¹ Mark Clodfelter, *The Limits of Air Power* (New York, NY: The Free Press, Macmillan Inc., 1989), 158-190. Kenneth A. Smith, *Joint Transformation of Aerial Interdiction by Enhancing Killbox Operations* (Maxwell AFB, AL: Air University Press, April 2006), 8-10. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA475658> (accessed January 22, 2012).

AirLand Battle

The Army exited Vietnam as a force in need of direction. It turned its attention to its primary threat in the Cold War environment, the Soviet Union, and the defense of Western Europe. Greatly outnumbered in personnel and arms, the Army began developing doctrine to fight and defeat a numerically superior force. Based largely on the speed and lethality of the 1973 Arab-Israeli war, the Army began developing doctrine originally known as Active Defense. Active Defense eventually evolved into a more offensive-centric doctrine known as AirLand Battle.⁴² AirLand Battle emphasized operational maneuver and attacking an enemy in all areas of his formation.⁴³ Fires played an important role in AirLand Battle.

The Army's new doctrine was heavily reliant on rotary-wing aviation fires. This sparked a new round of debates between the services. In 1975 the debate was settled as the Army and AF concurred that rotary wing aviation was "integral to the Army ground maneuver unit and is an extension of organic firepower."⁴⁴ The two services also agreed that "the attack helicopter does not perform CAS but is intended to complement Air Force CAS capabilities."⁴⁵

Since the Army did not possess the internal capability to attack the enemy in all areas, increased coordination and synchronization with the AF was necessary.⁴⁶ Although CAS was still required, the primary role of the AF in AirLand Battle was AI. Utilizing

⁴² Douglas W. Skinner, *AirLand Battle Doctrine* (Alexandria, VA: Center for Naval Analysis, September 1998), 3-10. <http://www.panzertruppen.org/2011/militar/mh032.pdf> (accessed February 10, 2012).

⁴³ Ibid., 16-21.

⁴⁴ Wolf, *The United States Air Force: Basic Documents on Roles and Missions*, 403.

⁴⁵ Ibid.

⁴⁶ James W. Ewing, *An Appraisal of United States Interdiction Doctrine for the Operational Level of War* (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1990), 18. <http://www.dtic.mil/dtic/tr/fulltext/u2/a227382.pdf> (accessed January 7, 2012).

AF operational reach the Army envisioned the AF attacking targets deep in enemy formations to disable its artillery, air defenses, and command and control nodes. The Army also envisioned the AF attacking second echelon enemy ground formations before they could mass against the Army.⁴⁷

AirLand Battle, by necessity, brought the Army and the AF closer together. Numerous discussions between the services were conducted to refine operational objectives. Ultimately an agreement was reached, with a standard priority for AI targeting between the services.⁴⁸

In 1979 the Air Force introduced a new type of AI in AFM 1-1. Battlefield Air Interdiction (BAI) was officially designated as an AI mission that “may have a direct or near-term effect on surface operations.”⁴⁹ BAI targeted enemy surface forces and necessitated the need for “air and surface commanders to coordinate their respective operations to ensure the most effective support of the combined arms team.”⁵⁰

Prior to the introduction of BAI, Interdiction was considered an independent operation. In versions of AFM 1-1 pre-dating AirLand Battle, AI was primarily an air-only mission and required little coordination with the ground force.⁵¹ This all changed with AirLand Battle.

AirLand Battle optimized the Army’s tactical maneuver and fires abilities with the AF’s ability to execute operational fires. By providing the AF priorities for AI

⁴⁷ Department of the Army, *Operations*, Field Manual 100-5 (Washington DC: U.S. Army, 1976), 4-8, 5-11.

⁴⁸ U.S. Joint Chiefs of Staff, *Joint Interdiction of Follow-On Forces*, Joint Test Publication 3-03.1 (Washington DC: Joint Chiefs of Staff, 1988), I-1.

⁴⁹ U.S. Air Force, *Functions and Basic Doctrine of the United States Air Force*, Air Force Manual 1-1 (Washington DC: U.S. Air Force, 1979) 2-13.

⁵⁰ Ibid.

⁵¹ Ewing, *An Appraisal of United States Interdiction Doctrine for the Operational Level of War*, 19-23.

targeting, and giving them responsibility for developing and independently executing fires against these targets, the Army optimized the AF's ability to execute flexible air power. To optimize Army and AF abilities to coordinate and attack the enemy throughout the depth of its formation, new organizations were introduced.

To support the AirLand Battle doctrine the Army constructed Battlefield Coordination Elements (later called Battlefield Coordination Detachment) in the 1980s to work in the JAOC. BCEs served as a liaison from the ARFOR/JFLCC to the JFACC to exchange operational and intelligence information. This small Army staff section facilitated close air support requests, air missile defense operations, theater airlift requirements, and airspace coordination between the two components. However, their primary role was to coordinate AI targeting and execution for the ARFOR/JFLCC. The introduction of BCEs was a major step forward in improving cross component fires and today BCDs are major contributors to joint fires operations.⁵²

The improved spirit of cooperation between the services reached its zenith in the mid-1980s as the two service chiefs, Generals Charles Gabriel (USAF) and John Wickham (USA), reached a landmark agreement on thirty-one joint initiatives designed to “field the most affordable and effective air-land combat forces.”⁵³ This agreement paved the way for a subsequent agreement in 1986 that replaced the 1966 McConnell-Johnson Agreement and supported the Army's employment of armed helicopters and AF employment of tactical fires in support of the Army.⁵⁴

⁵² Department of the Army, *Battlefield Coordination Detachment*, Field Manual 100-13 (Washington DC: U.S. Army, September 5, 1996), vii.

⁵³ Wolf, *The United States Air Force: Basic Documents on Roles and Missions*, 413-423.

⁵⁴ *Ibid.*, 413-414.

Although the mid-1980s were a time of agreement and harmony between the Army and AF, as a new conflict loomed just over the horizon, cross component fires tensions, once again, began to arise. In 1989, during the first statutorily required review of service functions, the roles and missions commission recommended two substantive changes. The biggest change was that all four services would perform close air support. However, Secretary of Defense Richard Cheney never acted on the recommendation, and the Army did not push for its implementation.⁵⁵

Operation Desert Storm

Although OPERATION DESERT STORM (ODS) provided the ideal venue to execute the concepts developed in AirLand Battle, the air battle plan developed and ultimately executed departed heavily from these concepts. Instead of focusing the majority of the operational air support on ground forces, the theater air plan was based largely on strategic attack focused on interrelated centers of gravity. The concept was to disable and dismantle Iraq's command and control apparatus and ability to wage war resulting in a "strategic paralysis" which would ultimately compel Iraq to withdraw from Kuwait. Targets such as political leadership, power projection plants, strategic air defenses and transportation nodes were given highest priority and were the primary focus of the first few weeks of the air campaign.⁵⁶ The Combined Force Air Component Commander's (CFACC) insistence on an air campaign focused on strategic attack was evidenced by a failure to apportion any ATO sorties for BAI.⁵⁷ This departure from

⁵⁵ Collins, *Military Roles and Missions: A Framework for Review*, 15.

⁵⁶ John A. Warden, *The Air Campaign* (Lincoln, NE: Excel Press, 2000), 146.

⁵⁷ Michael J. McMahon, *The Fire Support Coordination Line – A Concept Behind its Time?* (Fort Leavenworth, KS: School of Advanced Military Studies, May 6, 1994), 19.
<http://www.dtic.mil/dtic/tr/fulltext/u2/a284631.pdf> (accessed January 21, 2012).

AirLand Battle doctrine upset Army Corps commanders who argued that Iraqi ground units should receive the primary weight of the air campaign.⁵⁸

Ironically, after almost twenty years of development, AF leadership did not want to deploy A-10s to theater. Ultimately Army Chief of Staff, GEN Carl Vuono and Defense Secretary Cheney persuaded the AF to deploy the “hawgs”, which performed brilliantly, not in the traditional CAS role, but in executing BAI and armed reconnaissance. In fact, the A-10 proved to be the AF’s most powerful BAI platform, inflicting over half of the confirmed damage to Iraqi ground forces.⁵⁹

One air-ground issue that did surface once ground operations were initiated was the placement and utilization of the Fire Support Coordination Line (FSCL). The FSCL is traditionally viewed as the separation between the land and air battle and the separation between CAS and AI. During ODS the coalition used a combination of a doctrinal FSCL and killboxes to clear fires between the Army Forces (ARFOR) and Air Force Forces (AFFOR).⁶⁰ Killboxes are Fire Support Coordination Measures (FSCM) that normally utilize a geographic reference system as dimensions and possess the same characteristics as the FSCL. In essence, they are Free-Fire Areas for joint fires.⁶¹ When operating in closed killboxes, AFFOR assets were required to coordinate air-to-surface fires with the ARFOR. When operating in open killboxes, AFFOR assets could attack targets without

⁵⁸ Kenneth P. Neubauer, *Operational Leadership in Air Warfare: A Study of the Battle of Britain and Operation Desert Storm* (Newport, RI: Naval University Press, 1994), 19. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA279588> (accessed January 24, 2012).

⁵⁹ William L. Smallwood, *Warthog: Flying the A-10 in the Gulf War* (Washington, D.C.: Brassey’s, 1993), 169.

⁶⁰ Terrance J. McCaffrey, *What happened to BAI? Army and Air Force Battlefield Doctrine Development from Pre-Desert Storm to 2001* (Maxwell AFB, AL: School of Advanced Airpower Studies, 2002), 21. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA420526> (accessed January 7, 2012).

⁶¹ Air Land Sea Application Center, *Kill Box, Multi-Service Tactics, Techniques and Procedures for Kill Box Employment*, AFTTP 3-2.59 (Langley AFB: VA, Air Land Sea Application Center, August 2009), 1.

external coordination. The ARFOR planned to use its attack helicopters and artillery to shape operations forward of its Forward Line of Own Troops (FLOT). Unfortunately, they placed the FSCL well past the range of their internal assets and kept all killboxes short of the FSCL closed. This increased the coordination burden on the AFFOR, and in effect, turned all missions short of the FSCL into CAS. Although the ground and air forces were able to destroy the majority of the Republican Guard, the placement of the FSCL, and the limitations it placed on the AFFOR, contributed to portions of it escaping into Iraq.⁶²

While preaching joint operations leading up to the conflict, in practice the AF developed its own air battle plan based on its vision of how to effectively prosecute the war, and once ground operations commenced the Army limited the AF's ability to interdict enemy forces by its placement of the FSCL and its failure to open killboxes. These instances showed a great deal still needed to be done before the services reached true interdependence. Due to the short duration of ground operations, it is difficult to gauge the effectiveness of CAS during ODS.

Following the fall of the Soviet Union and after the completion of ODS, the Department of Defense once again reassessed service roles, missions, and functions. Central in these discussions was, once again, service participation in tactical-level fires. The opinion espoused by AF Chief of Staff Gen Merrill McPeak was especially provocative. Gen McPeak opined that modern warfare consisted of four distinct battle areas: "rear bases and supporting elements, the close battle for terrain, the deep battle beyond the frontline, and the high battle to win air superiority and defend against enemy

⁶² McMahan, *The Fire Support Coordination Line – A Concept Behind its Time?* 16-26.

aircraft and ballistic missile attacks.”⁶³ Air planners believed that no more than two services should be involved in any one area of this battlefield. They believed this model was a good start point from which to begin reducing redundancies and increase joint combat effectiveness.⁶⁴

Gen McPeak’s proposal met with sharp dissent from the others services. Included in his proposal was a transfer of Marine tactical fighters to the Navy, and a refocusing of the Army and Marine Corps on “close battle operations.” Under Gen McPeak’s proposal the Army and Marine Corps would be the primary executors of CAS, while the Navy and AF assumed supporting roles in ground operations.⁶⁵ Based on sharp disagreement from the other services, service functions remained largely unchanged.

Operation Enduring Freedom

Entering the 21st century, the role of tactical joint fires, and the proper service organizations to facilitate these functions, was still a source of friction between the two services. Following the September 11, 2001 attack on the U.S. homeland, the military was once again called into action. In order to quickly and decisively respond to events and defeat a new enemy, CIA agents and special operations forces were deployed to Afghanistan. These clandestine operators joined forces with Afghan tribal elements and directed AI and CAS missions from JFACC fighters and bombers to defeat Al Qaeda and remove the Taliban from government.⁶⁶

While the initial operations in Afghanistan were successful and resulted in quickly defeating the enemy, subsequent operations showed that major disconnects still

⁶³ Trest, *Air Force Roles and Missions: A History*, 254.

⁶⁴ Ibid., 254-256.

⁶⁵ Ibid., 255.

⁶⁶ Bob Woodward, *Bush at War* (New York: Simon & Schuster, 2002), 101, 134, 141.

remained between the services, especially in the execution of tactical joint fires. In March of 2002, the U.S. executed its first major ground operation to defeat Al Qaeda and Taliban elements in the Khwost-Gardez region.⁶⁷

The results of OPERATION ANACONDA are well documented. From a joint fires perspective, there were numerous shortcomings. Fires were provided to the tactical ground force from AH-64 Apaches, JFACC fighters and bombers, and AC-130s. Planning for ANACONDA morphed several times, and ultimately changed very late to include conventional ground forces. This contributed heavily to numerous joint fires shortcomings. The JFACC was not completely included in the planning until late, and an air support operations center (ASOC) was not employed to control aerial fires and integrate airspace.⁶⁸ Opinions from the Army espouse that there were difficulties coordinating AF fires, and that AH-64s were the most effective CAS platform in the operation.⁶⁹ AF participants counter this argument and state that although poor Army planning handicapped the AF, their fighters provided excellent CAS that was ultimately decisive in the battle.⁷⁰ Numerous debates have raged between the services in the ensuing years over what actually happened during the operation. However, the fact remains that there were definite planning and execution shortcomings that limited the effectiveness of tactical level fires.

In today's operations in Afghanistan, units are executing joint tactical fires with varying degrees of success and integration. Some units report successfully integrating

⁶⁷ U.S. Air Force, *Operation Anaconda: An Air Power Perspective*, (Washington DC: Department of the Air Force, February 7, 2005), 4. <http://www.af.mil/shared/media/document/AFD-060726-037.pdf> (accessed January 20, 2012).

⁶⁸ Ibid., 40.

⁶⁹ Robert H. McElroy, Patricia S. Hollis, interview with MG Franklin L. Hagenback, "Fire Support for Operation Anaconda," *Field Artillery Journal*, September-October 2002, 7.

⁷⁰ USAF, *Operation Anaconda: An Air Power Perspective*, 6.

CAS into unit operations, and establishing good working relationships with joint terminal attack controllers (JTAC) and tactical air control parties (TACP). However, others report that cross component integration continues to be difficult. In these units Army attack aviation remains the predominant means of executing fires. From all accounts, pilots and JTACs have performed, and continue to perform, very well. However, it is the team building aspect that often limits the effectiveness of tactical fires.⁷¹ The current structure lends itself to personality dependency, with levels of success largely dependent on the proactiveness of the individuals involved. Some units report they have become accustomed to AF personnel rotating out of theater during deployments and have developed procedures to work around this. Others are adamant that this remains an impediment to team building and negatively effects the execution of tactical fires.⁷²

Operation Iraqi Freedom

The environment for major combat operations during OPERATION IRAQI FREEDOM (OIF) was very similar to that of ODS a decade earlier. However, air-ground operations differed in execution at both the operational and tactical levels. Ground operations during ODS were not initiated until a six-week operational air campaign had been executed. During OIF, United States Central Command (CENTCOM) ground operations were initiated prior to theater air operations.⁷³

The theater air campaign focused initially on strategic attack by combining many of the “strategic center of gravity” concepts used in ODS with advanced network centric

⁷¹ James Lowe, Field Artillery Battalion Commander in Afghanistan, email to author, February 1, 2012.

⁷² Lowe, email to author, February 1, 2012. Sean Bateman, Field Artillery Battalion Commander in Afghanistan, email to author, January 29, 2012.

⁷³ Smith, *Joint Transformation of Aerial Interdiction by Enhancing Killbox Operations*, 18.

operations to form a concept called Rapid Dominance.⁷⁴ These concepts, coupled with advances in accuracy and lethality from precision guided munitions, allowed the Combined Forces Air Component Commander (CFACC) to quickly and successfully accomplish CENTCOM strategic air objectives.⁷⁵

Another major difference between OIF and ODS was the amount of air dedicated to the Combined Force Land Component Commander (CFLCC) for the destruction of the enemy fielded force. Almost eighty percent of the targets struck during major combat operations were in support of the CFLCC under the Killbox Interdiction/Close Air Support (KI/CAS) construct.⁷⁶ KI/CAS represented a maturation of the killbox construct used during ODS and relied on a geographic reference system to assign aircraft to various missions and move aircraft across the area of operations.⁷⁷ This massive air support resulted in CFACC assets destroying nearly eighty percent of the armor, artillery, and aviation that opposed the CFLCC. The vast majority of this destruction was achieved through AI, and the devastating effect of CFACC operational fires greatly contributed to Iraqi forces abandoning their vehicles and departing from the battlefield.⁷⁸

However, things were far from perfect in the tactical joint fires arena during OIF. The CFACC and V Corps utilized a concept called “push-CAS” during OIF. This meant the CFACC “pushed” CAS assets to the V Corps’ Air Support Operations Center

⁷⁴ Williamson Murray, “Air War in the Gulf: The Limits of Air Power,” in *Selected Readings Part III, Volume 1*, ed. by Strategy and Policy Department (Newport, RI: U.S. Naval War College, August 2004), 3.

⁷⁵ John D. Martin, *Misfire: An Operational Critique of Operation Iraqi Freedom (OIF) Targeting Strategy* (Newport, RI: U.S. Naval War College, August 2004), 8. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA465011> (accessed January, 14, 2012).

⁷⁶ U.S. Air Forces Central, *Operation Iraqi Freedom - By the Numbers* (Shaw AFB, SC: CENTAF Assessment and Analysis Division, 30 April 03), 5.

⁷⁷ Ross L. Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations* (Maxwell AFB, AL: U.S. Air Force Air University, March 2006), 12. <http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA463466> (accessed January 14, 2012).

⁷⁸ USAF-Central, *Operation Iraqi Freedom-By the Numbers*, 5.

(ASOC), where they were stacked at altitude until a ground maneuver unit needed to execute a CAS mission.⁷⁹ This method of controlling all assets at the ASOC resulted in an inefficient use of tactical air power and failed to fully utilize CFACC assets throughout the depth of the V Corps Area of Operations (AO). Instead of pushing unneeded CAS aircraft forward to execute killbox interdiction, CAS aircraft, controlled by the V Corps ASOC, often remained in orbits until they were low on fuel and were forced to return to their bases with unexpended ordnance.⁸⁰

This method of highly centralized tactical air control was in stark contrast to air-ground operations in the 1st Marine Expeditionary Force. 1 MEF employed much more decentralized command and control (C2), consisting of a Direct Air Support Center (DASC), Air Support Elements (ASE) resident at subordinate units, and multiple FAC(A)s to control and integrate tactical air operations throughout the 1 MEF AO. The result was much more efficient air support to the Marines. If aircraft were not needed in a CAS role, they were pushed forward and handed off to FAC(A)s to execute killbox interdiction far forward of the Marine FLOT. The Marine method of air-ground C2 became so effective that many AF pilots began contacting Marine air battle management agencies towards the end of their time on station to inquire about possible targets. The AF pilots were often directed to Marine forward controllers who employed them in an interdiction role.⁸¹

The other major joint fires problem during OIF was the placement of the FSCL. V Corps placed the FSCL far forward of its FLOT which, similar to ODS, caused the

⁷⁹ Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations*, 10.

⁸⁰ Ibid., 17.

⁸¹ Ibid.

CFACC to coordinate much of its fires.⁸² CENTCOM did establish a detailed killbox construct that was used in conjunction with traditional FSCMs. However, V Corps chose to rely primarily on its own internal assets to shape its AO, and kept killboxes short of the FSCL closed during the majority of the operation. This was especially true during the initial days of offensive operations. Thus, the FSCL placement and the failure to open killboxes impacted the effectiveness of tactical fires in support of V Corps.⁸³

Analysis of Joint Offensive Fires

Based on the historical performance of the two services in executing joint offensive fires since the establishment of the independent AF and the assignment of service functions, several conclusions can be established. First, the AF has excelled in executing strategic attack. This was true during WWII and has been reaffirmed by excellent performances in ODS and OIF. The AF did not excel in executing strategic attack only in conflicts in which political considerations prevented them from fully employing air power against strategic and operational targets in Korea and Vietnam.

The AF has equally excelled in executing operational-level AI. In both Korea and Vietnam, the AF successfully employed AI to destroy enemy reinforcements and logistical capabilities which contributed to the success of joint operations. AirLand Battle provided more cross component collaboration for AI. Subsequent AI performances in ODS and OIF showed the devastating effect of AF operational fires. Although there have been, and continue to be arguments between the services over the weight of effort given to strategic attack and AI, few will challenge the results of these two important aspects of operational fires in our recent history.

⁸² Ibid., 13.

⁸³ Ibid., 16.

The results achieved at the tactical level have been far less impressive. CAS employment in Korea was poor. It improved in Vietnam after a renewed AF commitment to its tactical role and the introduction of Army rotary-wing fires. OPERATION ANACONDA showed a complete lack of Army-AF synchronization in planning joint fires in support of tactical operations, and OIF displayed a lack of understanding by both services on methods to segment the battlefield and command and control tactical joint fires. The following chapter analyzes why, after sixty-four years of operating under a structure based on the 1947 establishment of service functions, we still encounter major challenges at the tactical level.

CHAPTER 3: FACTORS THAT INHIBIT EFFECTIVE CROSS COMPONENT OFFENSIVE FIRES

History shows that the role of providing tactical air support to the Army has been the most challenging aspect of Army-AF interdependence. There are several reasons why this is so difficult and why the two services have failed to excel in this area. A major reason for this is the different cultures and worldviews among the two services. This chapter analyzes these worldviews by discussing the different core competencies, functions, and modes of operation of the services and how these differences manifest themselves in divergent approaches to tactical fires. This chapter also examines the impact of inadequate service air-ground acumen regarding tactical-level offensive fires.

U.S. Air Force

Core Competencies and Functions

The U.S. Air Force views itself primarily as a strategic force with a vision of “global vigilance, reach and power.”¹ Their stated core competences are “developing airmen, technology to war fighting, and integrating operations.”² This focus on strategic missions is reflected in the AF’s twelve core functions: “nuclear deterrence operations, air superiority, space superiority, cyberspace superiority, global precision attack, rapid global mobility, special operations, global integrated ISR, command and control, personnel recovery, building partnerships and agile combat support.”³

¹ U.S. Air Force, “Our Mission,” U.S. Air Force, <http://www.airforce.com/learn-about/our-mission/> (accessed January 14, 2012).

² Ibid..

³ U.S. Air Force, *Fiscal Year 2011 Air Force Posture Statement* (Washington DC: Department of the Air Force, February 9, 2010), 4.

Mode of Operation

From its beginning, the AF has focused on being a strategic force that can project power and influence operations through the actions of highly skilled individual airmen. Its entire mode of operation is built on a centralized operational commander and staff developing an air battle plan, with subordinate commands and groups of individual airmen executing missions with the authority to exploit rapidly changing, fluid situations. This is what the AF means by centralized control, decentralized execution.⁴ Based on this mode of operation it is imperative that they have highly trained, skilled operators.

This strategic outlook, with a heavy emphasis on highly specialized, trained individuals, originates with the individual airman and permeates throughout the entire AF organization. The AF has specialists in almost every area of their service that receive very specialized training. This focus on technical excellence and specialization plays a major role in the success of the individual airman.⁵ Technical skills-based education and testing greatly impact the airman's promotion potential and career development.⁶ The focus the AF places on specialization and technical expertise is appropriate for the highly decentralized tasks they must execute in support of strategic and operational missions.

This mode of operation influences the airman's worldview and the way they execute operations. In recent years this has affected their deployment practices. While the Army has deployed primarily as units for twelve-to-fifteen month deployments, the AF tailors forces to place the right capability, in the proper place and time, to execute

⁴ U.S. Air Force, *Air Force Basic Doctrine*, Air Force Doctrine Document 1 (Washington DC: U.S. Air Force, October 14, 2011), 28.

⁵ Air Education and Training Command, *On Learning: The Future of Air Force Education and Training* (Randolph Air Force Base, TX: Air Education and Training Command, January 30, 2008), 2.

⁶ U.S. Air Force, *Airman Promotion Program*, Air Force Instruction 36-2502 (Washington DC: U.S. Air Force, August 6, 2002), 13-20.

missions. The AF deploys airmen utilizing a combination of the Air and Space Expeditionary Force (AEF) concept and individual deployments. AEF deploys units, parts of units, and individuals to support worldwide contingency operations. These deployments started at three-months and have evolved to six months in duration.⁷

U.S. Army

Core Competencies and Functions

The Army “conducts operations to deter conflict, prevail in war, and succeed in a wide range of contingencies in the future operational environment.”⁸ To accomplish this mission the Army’s primary core functions are combined arms maneuver (CAM) and wide area security (WAS).⁹ Core competencies that support the successful execution of CAM/WAS are: “operate decentralized, conduct continuous reconnaissance, conduct air-ground operations, expand capabilities at tactical levels, inform and influence populations, conduct effective transitions, and enhance unit cohesion.”¹⁰

Mode of Operation

The Army organizes, operates, and deploys in teams. From the moment a soldier enters the Army he/she is placed in a team. From the moment an officer comes on duty he/she is in charge of a team. Everything the Army accomplishes they accomplish as a team, and individuals are simply contributors to the efforts of the greater team. The Army

⁷ John A. Tirpak, “Struggling to Cover Commitments” *Air Force Magazine.com*, September 2010 under “Air Force deployments”, <http://www.airforce-magazine.com/MagazineArchive/Pages/2010/September%202010/0910commit.aspx>; (accessed December 31, 2011).

⁸ U.S. Army Training and Doctrine Command, *The United States Army Operating Concept 2016-2028*, TRADOC PAM 525-3-1 (Fort Monroe, VA: U.S. Army Training and Doctrine Command, August 19, 2010), 5.

⁹ Army forces conduct combined arms maneuver to gain physical, temporal, and psychological advantages over an enemy. Army forces establish wide area security to consolidate gains and ensure freedom of movement and action. Army forces employ combined arms maneuver and wide area security to seize, retain, and exploit the initiative. *Ibid.*, 11.

¹⁰ *Ibid.*, 16.

does train its individuals in specific skills. However, these skills are rarely performed in isolation. For example, the Army has nine-man infantry squads, eight-man artillery sections, and four-man tank crews. These elements combine with others to form thirty-man infantry platoons, sixteen-man tank platoons, and seventy-man artillery batteries. This team focus is prevalent from the squad to the division level.¹¹ This quote from The Army Operating Concept 2016-2028 emphasizes the importance the Army places on teams.

The Army must build cohesive teams and prepare Soldiers to withstand the demands of combat. Leaders must prepare their units to fight and adapt under conditions of uncertainty, and during the conduct of operations, must also ensure moral conduct while making critical time-sensitive decisions under pressure. Tough realistic training builds confidence and cohesion that serve as psychological protection against fear and stress in battle.¹²

Based on its emphasis on teams, soldiers and leaders are promoted primarily on how well they train and lead team members to accomplish missions.¹³

In executing warfighting operations, the Army also places a high value on teamwork. The Army fights as a combined arms team. Infantry and armor maneuver. They are supported by artillery, aviation, and engineers. Logistics units sustain the team, while many other teams contribute to their efforts in other ways. All these smaller teams come together to form a combined arms team. Combined arms teams are formed at all echelons, from company to division.¹⁴

¹¹ TRADOC, *The United States Army Operating Concept 2016-2028*, PAM 525-3-1, 20.

¹² Ibid.

¹³ Department of the Army, *Enlisted Promotions and Reductions*, Army Regulation 600-8-19 (Washington DC: U.S. Army, December 27, 2011), 54-60.

¹⁴ Department of the Army, *Operations*, Field Manual 3-0 (Fort Monroe, VA: U.S. Army Training and Doctrine Command, February 2008), 4-12.

In order to succeed as a combined arms team, it is important that each individual, and each element, is trained in his/her skill. However, equally important from the Army's point of view is that they plan, train, and execute with the same team they will fight with. In doing this, individuals and teams become familiar with each other and gain confidence in each other. Relationships and continuity matter in the Army. This is especially true when executing combat operations as is evidenced by this quote from the Army

Operating Concept:

Past theories have argued that the ability to tailor and scale formations would provide units task organized with the exact capabilities needed and would result in a more efficient use of forces. However, this approach has a significant negative impact on cohesion and combat effectiveness. The practice of constantly task organizing units, often at the last minute or even after deployment, degrades unit cohesion, trust, leader development, and mentorship of subordinate leaders. Units with organic or habitually assigned forces achieve a much higher level of trust, cohesion and combat effectiveness and are able to train to much higher levels.¹⁵

This mindset also shapes the Army's deployment philosophy. The Army believes that in order to succeed as units, individuals must be fully integrated into the teams they will fight in. The following quote underscores this emphasis on teamwork in training, deployment and executing combat operations.

For this reason it is essential that the Army synchronize the training, readiness, and deployment cycles of corps, divisions, and brigades to build cohesive teams, mentor subordinate leaders, and establish the level of trust necessary for successful decentralized execution."¹⁶

Service Worldview Affect on Tactical Fires

The stated objectives and core competencies espoused by the two services are very different. The AF emphasis on global reach and technological superiority is

¹⁵ TRADOC, *The United States Army Operating Concept 2016-2028*, TRADOC PAM 525-3-1, 20.

¹⁶ Ibid., 21.

appropriate for a service focused at the strategic/operational levels. Meanwhile, the Army's focus on combined arms operations executed through a team-centric approach supports its tactical level focus. These different visions, core competencies, and modes of operation affect the worldviews of the soldier and the airman, and contribute to viewing warfare through very different lenses.

The Army and AF can overcome their different worldviews when executing operational fires. Operational fires require an understanding of JFC objectives and a level of coordination and synchronization to focus assets and capabilities. The tactical level is where these two worldviews collide. Nowhere is this more apparent than in training, planning, and executing fires.

The AF has highly trained, qualified pilots, joint terminal attack controllers (JTACS), air support operation centers (ASOC), and tactical air control party (TACP) personnel who have actively supported the Army over the past ten years of war. Based on the Army's demand for more JTACs, the AF has committed to producing and deploying more.¹⁷ The AF has also committed to producing more ASOCs and will permanently align them with each of the Army's active duty divisions.¹⁸ ASOCs will team with Army fires, airspace control, and air defense personnel to form a joint fires-airspace execution cell at the Army division level known as the Joint Air Ground Integration Cell (JAGIC).¹⁹ JAGIC is a valid concept that both services are moving forward with, and the

¹⁷ U.S. Air Force, *Fiscal Year 2011 Air Force Posture Statement* (Washington DC: Department of the Air Force, February 9, 2010), 10.

¹⁸ United States Army, United States Air Force, *Memorandum of Agreement between the United States Army and the United States Air Force for Army/Air Force Liaison Support* (Washington DC: USA, USAF, March 31, 2011), 4.

¹⁹ U.S. Army Fires Center of Excellence, *Joint Air Ground Integration Cell White Paper* (Fort Sill, OK: U.S. Army Fires Center of Excellence, April 1, 2011), 1-3.

increase in JTACs is a step in the right direction to facilitate improved execution of joint fires at the tactical level.

While these steps will indeed provide improvements, increasing capacity by applying more resources will not fully address the problem. Divergent service worldviews will likely continue to prevent the services from maximizing the effectiveness of tactical level fires. As illustrated in operations in OIF and during OPERATION ANACONDA, Army commanders often have shown a preference for utilizing their own internal assets for close support and interdiction fires within their AOs. The primary reason for this is that Army leaders are more comfortable executing fires with internal assets with which they have trained, and have long-standing relationships. Attack aviators and field artillerymen train and deploy with Army units. They are involved in planning for operations. When it comes time to execute lethal fires in close contact with the enemy, Army personnel often select the asset they know and have confidence in based on relationships developed and shared experiences.²⁰ This phenomenon is not new. In Vietnam the main reason attack helicopters performed CAS was that the Army wanted an asset dedicated to them that was a member of their team.²¹

JTAC integration is an example of this phenomenon. “A JTAC is a qualified (certified) service member who, from a forward position, directs the action of combat aircraft engaged in close air support and other offensive air operations.”²² In order to effectively operate as part of the tactical level fires team, JTACs must be integrated into

²⁰ James Lowe, email to author, February 1, 2012.

²¹ Scott A. Hasken, *A Historical Look at Close Air Support* (Fort Leavenworth, KS: U.S. Army Command and General Staff College, June 6, 2003), 35. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA416360> (accessed January 14, 2012).

²² U.S. Air Force, *Joint Terminal Attack Controller Training Program*, Air Force Instruction 13-112, Volume 1 (Washington DC: U.S. Air Force, February 15, 2008), 1.

the Army unit they support. They should be integrated to the same degree as all other members of the fires team. This means living, working, and training together at all times. In doing this, units can train and develop tactics, techniques and procedures (TTP) for integrating and executing all aspects of fires in support of the unit.

JTACs and TACPs are normally assigned to posts with the Army unit they support. However, they are assigned to, and take their operational direction from, air support operations squadrons (ASOS).²³ There is no organizational mandate that places ASOS personnel inside the Army unit.²⁴ This results in a relationship that is largely dependent on the personalities and proactiveness of ASOS personnel, Army S3s, and fire support officers (FSO) at division, brigade, and battalion levels. In some instances the current system works fine. In others it does not, and fails to establish a true air-ground fires team.²⁵ This is especially true during operational deployments where Army staffs frequently work with numerous different ASOS personnel, based on AF deployment rotations.²⁶

JTACS are not the only position where service policy and cultural difference effect the execution of tactical joint fires. This same phenomenon holds true for the AF approach to supporting CAS missions. The AF has highly trained pilots who are fully qualified and capable of executing CAS in support of the Army. They have been doing so for the past ten years. However, based on the AF method of operating, pilots are not fully

²³ Ross L. Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations* (Maxwell AFB, AL: U.S. Air Force Air University, March 2006), 43. <http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA463466> (accessed January 14, 2012).

²⁴ Mark G. Cianciolo, *U.S. Army-U.S. Air Force: Can They Fight as a Combined Arms Team?* (Fort Leavenworth, KS: Combat Studies Institute Press, December 17, 1998), 38. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA366201> (accessed January 14, 2012).

²⁵ James Lowe, Field Artillery Battalion Commander in Afghanistan, email to author, February 1, 2012. Sean Bateman, Field Artillery Battalion Commander in Afghanistan, email to author, January 29, 2012. Roy Sevalia, Division Fire Support Coordinator in Iraq, email to author, February 23, 2012.

²⁶ Ibid.

leveraged in support of Army units they are supporting. The AF pilot receives a mission assignment via the daily air tasking order (ATO) and plans their mission. As they fly into the area of operations (AO), they check in with an air battle management agency (CRC, AWACS, ASOC) where they receive instructions. If they are required to execute a CAS mission in support of a ground unit, they are directed to contact a controlling JTAC. They make contact with the JTAC, receive a situation update and mission instructions, execute the mission, and return to their airbase. This method of operation is very isolated from the ground unit they are actually supporting and is very different from the rest of the Army tactical fires team.²⁷

When executing daily operations, Army aviators and fires personnel are heavily involved in planning with the maneuver units they support. They understand the scheme of maneuver, and have detailed graphics, Fire Support Coordination Measures, Airspace Coordination Measures, and Maneuver Coordination Measures. They understand ground priorities and how the commander desires to utilize fires in support of the operation. Because they participate in planning and the daily execution of operations, they establish relationships and become trusted members of the team.²⁸

The AF pilots that execute CAS are just as important, and sometimes more so, than the indigenous Army members of the combined arms team. However, they are complete unknowns to the Army unit they are supporting, as they do not participate in planning, training, and rehearsals for missions flown in support of Army units.²⁹ These

²⁷ William Vessey, "Combined Arms in the CAS Firefight," *Air Land Sea Bulletin*, March 2010, 12.

²⁸ Department of the Army, *Operations*, Field Manual 3-0 (Fort Monroe, VA: U.S. Army Training and Doctrine Command, February 2008), 4-12.

²⁹ Vessey, "Combined Arms in the CAS Firefight," *ALSA*, 12.

personal relationships that lead to trust and understanding are what is lacking between the Army and AF that limit the effectiveness of aerial fires at the tactical level.

Air/Ground Leaders

The following is an excerpt from MajGen Mattis' discussion with 2nd Marine Division aviators following a rehearsal for offensive operations in support of OIF.

“My principal enabler for speeding the division’s advance is Marine Aviation. Therefore, my biggest concern is Marine Aviation’s ability to find Iraqi artillery and surface to surface missiles capable of delivering chemical munitions thus slowing our speed of advance. I don’t want you concerned too much about Iraqi tanks, I have the best anti-tank weapon in the world, and that’s the M-1. Where are my Cobra guys?”

Three to four pilots, one of them a squadron commander, raised their hands and MajGen Mattis again points to the map and says “you guys need to be just behind but no further than my forward lines and looking for targets to my immediate front and to the maximum range of your TOW and Hellfire missiles. If there’s armor to our front, you will be directed to attack key vehicles before they get within range of my M-1’s. If there’s nothing going on, I want you to land behind my lines and save gas. If there’s something big I’ll expect your FAC(A)s to work with the fixed-wing CAS and direct them where you need them. Where are my fixed-wing guys?”

About ten aviators raise their hands. “You guys are equally as critical; you need to be ranging from five clicks to sixty miles to my front and along the flanks of my route of advance and find and kill Iraqi artillery, surface to surface missiles, command posts, and armored columns in that order of precedence. You also need to screen my eastern flank and alert me of any Iraqi movement towards the west. After that, fly deeper and look for and kill surface to surface missiles, command posts, and massed Iraqi forces. I will also want you to be available for CAS, but I don’t expect that to happen often. The Cobra is my best CAS asset and that’s what I plan on using it for. Above all else, I am most vulnerable to Iraqi artillery capable of delivering chemical munitions. You fixed-wing guys are the eyes of my division; you have to find and destroy the Iraqi artillery before it can engage my Marines and I’ll engage or maneuver around the rest; any questions?”³⁰

³⁰ Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations*, 5-6.

How many Army and AF leaders possess the level of comprehensive knowledge to understand tactical operations in the air-ground dimension to this level of fidelity? The historical information presented earlier in this paper and the tactical air-ground issues of today suggest the answer to this question is “not many.” Army and Air Force leaders receive training and education based primarily in the domain in which they operate. This leads Army leaders to see and plan operations from a ground perspective, while AF leaders see and plan operations from an air-centric perspective.

In the Army, very little in an officer’s training and education prepares him or her to see operations through an air-ground lens. Tactical leaders learn their craft through institutional instruction and collective training at the Combat Training Centers early in their careers. In both instruction and training AF fires are introduced and sometimes practiced. However, they are usually secondary training events. Because so little emphasis is given to air operations, ground leaders don’t usually completely understand it. This leads to air operations receiving little emphasis inside the Army, and causes Army leaders to look for solutions to land warfare problems in Army terms.³¹ Witness this quote from COL Michael Formica, a former Brigade Commander in Iraq.

In my first few months in country, I rarely put air into my plan – this was because we did not understand how it could assist us in a counter insurgency battle – then I saw the incredible results in Fallujah and in our follow-on operations. After that, in our North Babil operations and election prep, I never left without my JTAC and always requested air to support our operations.³²

³¹ David A. Fastabend and Robert H. Simpson, “Adapt or Die: The Imperative for a Culture of Innovation in the United States Army,” *AUSA.org*, February 2004, under “Army leaders,” <http://www.ausa.org/publications/armymagazine/archive/2004/2/Pages/default.aspx> (accessed January 14, 2012).

³² Howard D. Belote, “Counterinsurgency Airpower: Air-Ground Integration for the Long War” *Air and Space Power Journal*, Fall 2006, 60.

This is a quote from an experienced, successful Army leader engaged in combat operations. Despite his career success, and the fact that he was currently engaged in dangerous combat operations, he initially did not consider tactical air support as a primary means of executing fires. He readily admits that he did not understand air and how it could be used in his unit's operations. This is not a criticism of COL Formica. The fact is that Army education and training does not facilitate leaders viewing operations in terms of the air and ground domains. Due to this fact, most Army leaders plan their operations based on their internal assets because they are more comfortable with them. This is a single quote from a commander operating in an individual area of operations in Iraq. This lack of understanding has manifested itself in much larger operations as well.

In 2003, during the OIF attack to Baghdad, V Corps shaping operations further demonstrated a lack of understanding of the application of air power in support of tactical ground operations. V Corps' intent was to utilize its own internal assets, attack helicopters and Army Tactical Missile Systems (ATACMS), to destroy Iraqi Republican Guard forces forward of 3rd Infantry Division's attack. Relying primarily on internal assets caused V Corps to place the Fire Support Coordination Line (FSCL) far forward of its Forward Line of Own Troops (FLOT), and keep CENTCOM-designed killboxes closed.³³ This introduced the air-ground challenges referred to earlier in the paper. This method of operation also took away one of the great strengths of the AF; the ability to find and flexibly attack targets with massive and accurate firepower.

Another result of V Corps' mode of operation was that they utilized attack helicopters to attack targets deep in their AO. The choice to utilize attack helicopters

³³ Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations*, 13.

instead of CFACC assets led to disastrous results in the 23 March 2003 attack on the Iraqi Medina Division in Najaf. During this “deep attack” one helicopter was shot down, all but one was damaged by enemy fire, and the operation failed to achieve its objective of destroying the enemy division.³⁴

Why would an Army Corps establish Fire Support Coordination Measures that restricted the CFACC’s ability to support its operations? Why would an Army Corps rely on its own internal assets when a massive AF was on hand for just this purpose? Why would an Army Corps execute a very dangerous and risky cross-FLOT attack helicopter operation when the CFACC could have achieved the desired effect with far less risk involved?

The answer to all these questions originates from a lack of understanding of air operations by Army leaders. If Army leaders truly understood operations from an air-ground perspective, joint air-ground operations would have been planned from the start. However, based on their education, training, and trust Army leaders operated in a manner with which they knew and were comfortable.

A lack of training and understanding of air-ground operations is not specific to just the Army. How many Air Force leaders really understand Army tactics to the degree that they can successfully integrate fires in support of them?

One of the primary points of contention, and where the lack of mutual air-ground understanding manifests itself, is in the concept of “centralized control, decentralized execution.” The basis for this mode of operation is that it leads to the efficient, flexible application of air power. In order to execute multiple air operations a highly centralized

³⁴ Gregory Fontenot, E.J. Degen, and David Tohn, *On Point: The United States Army in Operation Iraqi Freedom* (Fort Leavenworth, KA: Combat Studies Institute Press, 2004), 179.

method of control is necessary. It requires a broad theater-wide perspective and is implemented by an airman that possesses theater-wide knowledge in order to properly prioritize limited air assets.³⁵ Thus, dedicated support to Army units is not the best, or most feasible, way for the AF to operate. However, the Army has been arguing for years that dedicated CAS capabilities are what they need when executing tactical operations.³⁶

Centralized control, decentralized execution in support of ground operations represents a fundamental lack of understanding of the complexity of tactical ground operations and a lack of understanding of the teamwork and cohesion required to execute them. Ground operations involve multiple different pieces and units operating together to achieve an objective.³⁷ Supporting ground operations requires more than just showing up at a certain time in order to execute.

Using a sports analogy, tactical-level ground operations are like a football team. The team gets all its members together and they practice and prepare for the game. The coach devises a game plan and all the players understand it. If a player shows up just prior to the game or worse, during the game, the team is uncomfortable putting him in and letting him play. Because they haven't practiced with him they don't really understand what he can bring to the team. They will use him because he is talented. However, his talent isn't maximized because they don't use him to his full potential. Also, because he doesn't stay for the entire game and is replaced by a new player, his teammates don't really get to know him and his capabilities. The next time they play a

³⁵ USAF, *Air Force Basic Doctrine*, AFDD 1, 28.

³⁶ Ian Horwood, *Interservice Rivalry and Airpower in the Vietnam War* (Fort Leavenworth, KS: Combat Studies Institute Press, 2006), 63-64.

³⁷ Department of the Army, *Operations*, Field Manual 3-0 (Fort Monroe, VA: U.S. Army Training and Doctrine Command, February 2008), 4-12.

game they're not really sure how much they can count on him, so they don't plan to use him. They'll do the best they can with the players that are there every day.

In a nutshell, this analogy is the Army's opinion of AF support to tactical operations. It has largely been brought on by decades of training, and numerous conflicts, in which the AF tenant of centralized control, decentralized execution has been the norm. Centralized control, decentralized execution is very effective in executing AI, strategic attack, and other air missions that don't require detailed integration and synchronization with a ground element. However, history has shown, and continues to show, it can be problematic when executing tactical air-ground operations.

CHAPTER 4: TACTICAL OFFENSIVE FIRES SHORTCOMINGS

The lack of cohesiveness that exists between the Army and AF at the tactical level has manifested itself in not maximizing and fully synchronizing several aspects that could improve tactical offensive fires execution. Army attack aviation, airspace control, and FAC(A) are three examples of this and are discussed in the paragraphs below. The Marine Corps construct for tactical fires is also examined as a possible model for the future.

Army Attack Aviation

The Army began arming helicopters to provide ground forces with aerial fire support during Vietnam to fill a perceived gap in AF support to tactical ground operations. In the 1970s and 1980s, AirLand Battle implementation coincided with the development and fielding of the AH-64 Apache helicopter. The AH-64 possessed the ability to fire laser-guided munitions which could destroy enemy armor at long range. Based on AirLand Battle doctrine, the primary means for employing AH-64s was in attacks deep within an enemy's Area of Operation.¹ During ODS, the Army executed several deep aviation attacks against Iraqi formations with devastating effect.² Thus, the doctrine of deep aviation attack became a guiding principle for a generation of Army aviators.

As the Cold War ended and the Army refocused its doctrine on full spectrum operations, Army Aviation doctrine changed as well. Although still acknowledging its primary mission was deep attack, the 1997 version of FM 1-100, Army Aviation

¹ Department of the Army, *Operations*, Field Manual 100-5 (Washington, D.C.: Department of the Army, 1982), 7-6.

² Stephen Bourque, *Jayhawk! The VII Corps in the Persian Gulf War* (Washington D.C.: Department of the Army, 2002), 313.

Operations, stated “the primary purpose of attack helicopter operations is the destruction of enemy ground forces at decisive points. Attack units can conduct deep operations or be used in conjunction with ground maneuver units during close battle operations.”³

Although Army attack aviation was employed essentially as a CAS platform during OPERATION ANACONDA, the primary view of the Army in the new century remained fixated on the deep attack. This manifested itself during the V Corps deep attack during OIF in March of 2003. Since that time Army attack aviation has been primarily employed using a tactic called close combat attack (CCA). The following is an excerpt from the 2003 edition of FM 3-04.111 *Aviation Brigades*.

For aviation units, close combat attack (CCA) is defined as a hasty or deliberate attack in support of units engaged in close combat. During CCA, armed helicopters engage enemy units with direct fires that impact near friendly forces. Targets may range from a few hundred meters to a few thousand meters. CCA is coordinated and directed by a team, platoon, or company-level ground unit using standardized CCA procedures in unit SOPs.

Effective planning, coordination, and training between ground units and armed aircraft maximize the capabilities of the combined arms team, while minimizing the risk of fratricide. This procedure is best suited for units that maintain a habitual combined arms relationship during training and war.

The CCA briefing follows the joint standard nine-line format with minor modifications for Army helicopters. The briefing provides clear and concise information in a logical sequence that enables the employment of weapons systems. It also provides appropriate control to reduce the risk of fratricide.

Before the armed helicopter team engages, the target must be confirmed by the aircrew and friendly unit in contact. During engagement, open communication and continuous coordination with friendly ground elements are required to ensure the desired effect. Coordination of the direct and indirect fires from all participants produces the most efficient

³ Department of the Army, *Army Aviation Operations*, Field Manual 1-100 (Washington, D.C.: Department of the Army, 1997), 2-5.

results in the least amount of time, with the least risk to all. This coordination includes CAS and any nonlethal methods that may be employed.⁴

Compare the definition of CCA to the joint close air support definition of: “air action by fixed- and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of each air mission with the fire and movement of those forces.”⁵ CCA even uses the nine-line report used by AF JTACs when executing CAS.

The fact is that Army attack aviators have been executing CAS for the past decade in combat just as they did in Vietnam a generation ago. The Army may have called it direct aerial fire support then, and close combat attack now. However, it is CAS. Inter-service bickering over service functions has forced the Army to use colorful language and definitions to cloud the truth.

This delineation in terms has had an effect though. Based on the definitions of direct aerial fire support and close combat attack, the Army aviation community believes they do not perform CAS. This coupled with the doctrine of deep attack has led the Army not to classify attack aviation as a fires element.⁶ This distinction often prevents synchronization in training, doctrine, and operational execution with Army ground fires elements.

This bifurcated relationship between Army ground fires and Army attack aviation, coupled with the nature of the relationship with AF tactical fires elements, leads to

⁴ Department of the Army, *Aviation Brigades*, Field Manual 3-04.111, (Washington, DC: Department of the Army, 2003), Q-15.

⁵ U.S. Joint Chiefs of Staff, *Close Air Support*, Joint Publication 3-09.3 (Washington DC: Joint Chiefs of Staff, July 8, 2008), I-1.

⁶ USA, *Army Aviation Operations*, FM 1-100, 2-5.

desynchronization and a reduced effectiveness of tactical fires. There is no inherent air-ground, fires team. Army fires, aviation, and AF ASOS personnel have been battling through this for years. Usually they piece together ad hoc procedures to make it work in combat. However, as history has shown, it usually takes several setbacks before this occurs, and even then it often fails to maximize the effects of tactical level fires.

Airspace Control

Airspace control is increasingly important in today's environment with the large numbers of unmanned aerial systems (UAS) operating over the battlefield. Army controlled low-altitude UASs must be synchronized with higher-level AF UASs, JFACC fighter, bomber, tanker, and transport aircraft operating at various altitudes, rotary-wing aircraft, surface-to-surface fires, and surface-to-air systems to ensure aircraft safety and facilitate effective fires in support of JFC operations.⁷

As stated in Chapter 1, to facilitate the command and control of airspace above the Joint Operations Area (JOA) the JFC establishes a Theater Air Control System and appoints an Airspace Control Authority (ACA) to oversee its execution. The JFACC is normally appointed these duties since he possesses the majority of the assets operating in the airspace. As ACA, the JFACC is responsible for synchronizing airspace operations among the components to ensure unity of effort in executing joint operations.⁸

At the operational level this system works well. Arranging and controlling airspace parameters that enable the execution of operational, joint force command and component objectives, is effectively executed through this system. However, airspace operations at the tactical level are where things are difficult.

⁷ U.S. Joint Chiefs of Staff, *Joint Airspace Control*, Joint Publication 3-52 (Washington DC: Joint Chiefs of Staff, May 20, 2010), I-2.

⁸ Ibid., I-1 - I-4.

The Army utilizes a combination of aviation operations, air traffic control and air defense specialists to perform airspace command and control (AC2). However, these personnel are largely focused on Army aviation and air missile defense operations. In recent years the Army has introduced Air Defense and Airspace Management/Brigade Aviation Elements (ADAM/BAE) to integrate tactical-level airspace requirements into theater airspace operations.⁹ ADAM/BAE has done excellent work in the past decade of war, and has provided a marked improvement in Army AC2 at the tactical level. However, ADAM/BAE possesses only the capability to integrate low numbers of airspace users operating at relatively low altitudes inside brigade AOs.

The current Army air ground system (AAGS) still has gaps in the integration of tactical airspace requirements and operations into theater airspace operations. The Army does not possess personnel or organizations capable of integrating multiple airspace users and deconflicting aircraft with fires within and above a large AO. The Army attempts to do this by combining ASOC/TACP personnel, with Army AC2, and fires personnel at the highest tactical echelons. This works to a degree in confined areas with low airspace use. However, as airspace becomes more congested above Army AOs, and the deconfliction between fires and airspace users more important, the current system falls short. For this reason JFACC/ACAs are often uncomfortable with Army components controlling large amounts of airspace. Because Army commanders require airspace to execute fires without higher coordination, a conflict often occurs.¹⁰

⁹ Hobby F. Cupp, *A U.S. Army Formal FAC(A) Program is the Solution for Improving Joint Fires Integration for the Maneuver Commander* (Maxwell AFB, AL: U.S. Air University, February 2009), 8. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA539620> (accessed January 14, 2012).

¹⁰ U.S. Army Fires Center of Excellence, *Joint Air Ground Integration Cell White Paper* (Fort Sill, OK: U.S. Army Fires Center of Excellence, April 1, 2011), 1-3.

The Army and AF have renewed their efforts to rectify this problem with JAGIC. JAGIC will undoubtedly improve the current airspace situation at the tactical level.¹¹ However, the personnel in JAGIC are not experts in airspace command and control. ASOC/TACP personnel execute airspace control and integration as secondary duties and Army AC2 personnel are not trained to integrate large numbers of airspace users operating at higher altitudes. While JAGIC is a major improvement, it does not possess trained air support operations controllers (airspace integrators), such as those resident in the Marine Corps Direct Air Support Center (DASC).¹²

Forward Air Controller-Airborne

A Forward Air Controller-Airborne (FAC(A) is a “specifically trained and qualified aviation officer who exercises control from the air of aircraft engaged in close air support of ground troops. The forward air controller (airborne) is normally an airborne extension of the tactical air control party.”¹³ FAC(A)s provide a mobile, airborne platform that often has better visibility and situational awareness than ground-based JTACs, and like JTACs, can control and synchronize fires and airspace operations in support of tactical ground operations. FAC(A) is a function that was used very effectively by both AF fixed-wing pilots and Army rotary-wing pilots in Vietnam.¹⁴ However, in today’s operations FAC(A) is rarely utilized by the Army and AF.¹⁵ The question is why is FAC(A) not being utilized when there is a shortage of JTACs, and current and future

¹¹ FCOE, *Joint Air Ground Integration Cell White Paper*, 1-7.

¹² Ross L. Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations* (Maxwell AFB, AL: U.S. Air Force Air University, March 2006), 48.
<http://www.dtic.mil/cgibin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA463466> (accessed January 14, 2012).

¹³ U.S. Air Force, *Counterland Operations*, Air Force Doctrine Document 2-1.3 (Maxwell Air Force Base, AL: LeMay Center for Doctrine Development, September 11, 2006), 97.

¹⁴ Cupp, *A U.S. Army Formal FAC(A) Program is the Solution for Improving Joint Fires Integration for the Maneuver Commander*, 16.

¹⁵ *Ibid.*, 6.

operations demand increased synchronization of fires and airspace operations at the tactical level? Why are we not utilizing FAC(A) when we have qualified AF FAC(A)s and a program to train and certify Army Aviators?¹⁶ This is a unique capability that could vastly improve tactical fires execution and integration.

The answer to these questions goes back to trust, confidence, teamwork, and air-ground acumen. Most Army leaders do not have the requisite understanding of how FAC(A) can enhance their operations. Since they don't have habitual relationships with FAC(A)s, and FAC(A)s don't participate in training, planning, and wargaming sessions, they are uncomfortable with them controlling and directing fires in support of their operations. Also, based on a lack of understanding, the Army has chosen not to train rotary-wing aviators as FAC(A)s.¹⁷

There is historical evidence that FAC(A)s are effective. However, this is yet another example of where the limitations of the current service functions, and resulting service structures, inhibit the fires team at the tactical level. In examining possible tactical-level air-ground models for the future, it is instructive to look at the Marine Corps.

Marine Air-Ground Operations

“Marine aviation units are an integral element of an air-ground combat system. They are not merely joined at the top when the time comes to fight. They are fully integrated from top to bottom, and they train that way fulltime.”¹⁸

—Gen Carl E. Mundy

¹⁶ Director Joint Staff J8, *Joint Close Air Support Action Plan Memorandum of Agreement 2004-02 – Joint Forward Air Controller (Airborne)* (Washington DC: Joint Staff J8, February 1, 2012), 3-31.

¹⁷ William Vessey, “Combined Arms in the CAS Firefight,” *Air Land Sea Bulletin*, March 2010, 12.

¹⁸ U.S. Marine Corps, *Aviation Operations*, Marine Corps Warfighting Publication 3-2 (Washington DC: U.S. Marine Corps, May 9, 2000), 4-1.

The Marine Corps has maintained its own aviation assets since 1912.¹⁹ In the battles over service functions, it has been successful in retaining its aviation arm by arguing that organic aviation is required to provide fires to the Corps.²⁰ Marines have also been largely successful in maintaining control of their aviation assets during wartime.

There are several keys to the success of Marine air-ground operations. First, Marines have one worldview. Unlike the AF, Marine aviators execute one primary mission: tactical level fires in support of ground operations. This worldview is established early in their careers, and reinforced through education, training, and warfighting. Achieving this unity of effort enables ground and air operators to see the battlefield through a single prism and successfully synchronize aerial fires with ground operations.²¹

Marines also have a healthy understanding of air-ground operations. Because Marines have an air arm, heavily integrated for fires, ground Marines learn to plan and execute air operations. They grow up in an environment where air and ground operations are not separated, but are intertwined. Greater understanding is reinforced and developed through training. It results in leaders and Marines who view and understand warfare from both dimensions of the battlefield.²²

¹⁹ Marines, "The Birth of Marine Corps Aviation," Marines, http://www.marines.com/main/index/winning_battles/history/innovations/first_marine_aviation (accessed on January 5, 2012).

²⁰ Ian Horwood, *Interservice Rivalry and Airpower in the Vietnam War* (Fort Leavenworth, KS: Combat Studies Institute Press, 2006), 14.

²¹ Vessey, "Combined Arms in the CAS Firefight," *A LSA*, 12.

²² Lawrence R. Rogers and John P. Farnam, "Airborne Recon Supported Marines' Advances in Iraq" *U. S. Naval Institute Proceedings*, June 2004, 45.

The third key to successful Marine air-ground operations is organization. Tailored air combat elements (ACE) are fully integrated with the ground combat element (GCE) to form the Marine Air Ground Task Force (MAGTF). Under this construct Marine fixed-wing and rotary-wing aviation work directly for the MAGTF commander and provide close air support, direct air support,²³ AI, armed reconnaissance, and numerous other air missions in direct support of the ground combat element. To facilitate the integration of marine aviation into MAGTF operations the ACE commander also serves as the MAGTF commander's principle air advisor.²⁴

Marine air operations are governed by the Marine Air Command and Control System (MACCS). MACCS integrates Marine aviation with the GCE by performing air direction, airspace management, and airspace control. MACCS relies on the Tactical Air Command Center (TACC), Direct Air Support Center (DASC) and the Tactical Air Operations Center (TAOC) to perform these functions. The TACC plans, coordinates, and supervises the execution of all future and current air operations in support of the MAGTF. The TAOC is responsible for airspace integration and control above the Marine AO. The DASC is the principle MACCS organization responsible for the direction and integration of Marine air with the ground element.²⁵ The organization of the DASC facilitates the integration of tactical air support. Unlike the AF ASOC, which is composed primarily of officers and JTACs, the DASC is composed of career-field designated air support operations controllers.²⁶

²³ "Direct Air Support (DAS) is an air action against enemy targets at such a distance from friendly forces that detailed integration of each mission with fire and movement of friendly forces is not required." USMC, *Aviation Operations*, MCWP 3-2, 2-2.

²⁴ Ibid., 2-1 – 2-2.

²⁵ Ibid., 4-7 – 4-10.

²⁶ Ibid., 48.

The MACCS and the MAGTF organization enhance the Marine's understanding and application between fires and airspace command and control. Marines operating in the DASC successfully integrate and deconflict fixed-wing aircraft, rotary-wing aircraft, surface-to-surface fires, and air defense fires. They work in concert with the Fire Support Coordination Center to fully integrate fires and airspace in, and above, the Marine AO.²⁷

At the lower tactical levels, Marine Air Officers, Forward Air Controllers (FAC), and JTACs are assigned to the ground command they support. This facilitates integrating aerial support into ground operations on a daily basis.²⁸

The fourth key to Marine air-ground operations is that they have a doctrinal construct for executing tactical-level air-ground fires. Marines first establish how they desire to apply fires against the enemy. Normally, they execute surface-to-surface fires and rotary-wing and fixed-wing CAS in the main battle area. They then establish a battlefield coordination line (BCL),²⁹ usually 20-30 km forward of the FLOT, and execute internal AI with Marine aviation from the BCL to the FSCL. Because the BCL is internal to the Marine commander it can be moved without consultation with other

²⁷ Keith B. McCutcheon, "Marine Aviation in Vietnam, 1962-1970." Naval Review (Annapolis, MD: U.S. Naval Institute, May 1971), 138.

²⁸ Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations*, 50.

²⁹ Battlefield Coordination Line (BCL): "A fire support coordinating measure which facilitates the expeditious attack of surface targets of opportunity between the measure and the FSCL. When established, the primary purpose is to allow MAGTF aviation to attack surface targets without approval of a GCE commander in whose area the targets may be located. To facilitate air-delivered fires and deconflict air and surface fires, an airspace coordination area (ACA) will always overlie the area between the BCL and the FSCL. Ground commanders may strike any targets beyond the BCL and short of the FSCL with artillery and/or rockets without coordination as long as those fires deconflict with the established ACA overhead." U.S. Marine Corps, *Fire Support Coordination in the Ground Combat Element*, Marine Corps Warfighting Publication 3-16 (Quantico, VA: Marine Corps Combat Development, Doctrine Command, November 28, 2001), B-3.

components. This doctrinal construct provides a great deal of flexibility and enables them to successfully execute fires throughout the depth of their AO.³⁰

The fifth key to successful Marine air-ground operations is that there is no ambiguity about the role of attack helicopters. They perform CAS.³¹ Since they do perform CAS Marine helicopter pilots have a thorough understanding of fires and the entire Marine air-ground construct. They are integrated and synchronized with Marine artillery and fixed-wing aviators to form a true fires team. They control and direct fixed-wing aviation and artillery in their role as FAC(A)s. They also frequently serve with ground commands as FACs. As such, they gain an even greater understanding of air-ground fires.³²

The final key to successful Marine air-ground operations is teamwork. Marines refer to it as the air-ground team, and it truly is.³³ Marines organize, train, deploy and fight with the same members of the air-ground team at all levels. Fixed-wing aviators, rotary-wing aviators, JTACS, and field artilleryman are all integrated on a daily basis to provide the ground unit fires. This promotes trust and confidence between air and ground operators and leaders. It facilitates effective fires, promotes effective airspace command and control, and enables the Marine Corps to execute more decentralized air control techniques, such as FAC(A).

There are many reasons for the Marine Corps' successful integration of tactical-level air-ground operations. They are manned and equipped with the proper capabilities

³⁰ Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations*, 14.

³¹ USMC, *Aviation Operations*, MCWP 3-2, 2-1.

³² Roberts, *Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations*, 66.

³³ USMC, *Aviation Operations*, MCWO 3-2, 3-3.

to provide ground Marines the level of aerial fires required for their missions. They are organized in a way that integrates aerial fires into ground operations on a daily basis. They have air-ground doctrine that facilitates maximizing the effects of each of their fires platforms throughout Marine areas of operation. However, the main reason for the Marines success is that air and ground operators have one worldview. They approach warfighting from a single prism. This results in establishing a true air-ground fires team.

The Army relies more heavily on its internal artillery for tactical level fires than the Marines. Thus, completely replicating the Marine model, with its large air element, is not necessary. However, there are many aspects of the Marine construct in the organizational, doctrinal, and functional realms that could be adopted by the Army in hopes of establishing a true air-ground team and improving tactical offensive fires planning and execution in the future.

CHAPTER 5: DEFENSIVE FIRES HISTORY

Establishment and Execution of Defensive Fires Functions

As with offensive joint fires, Army-AF service functions debates centered on air missile defense have, at times, become heated. However, in totality, they have been much more civilized than those involving offensive fires. Much of this is probably due to the fact that the U.S. has not faced a real aerial threat since 1945. This coupled with the operational/strategic nature of missile defense lends itself to more agreement and less inter-service rivalry than with offensive fires.

This is not to say that conflicts have not arisen. During discussions prior to the establishment of service functions in 1947, the AF was adamant that it desired control of the entire air defense system. However, based on the competitive service environment of the day, the Navy, and especially the Army, were dubious of giving up their internal air defense capabilities.¹ Ultimately, the Army-AF Implementation Agreements in September 1947 assigned the AF responsibilities for intelligence, strategic missile systems, strategic air defense, and research and development for guided missiles. The Army maintained responsibility for tactical, land-based air defense.²

Service functions have remained largely unchanged in the air and missile defense arena since their initial establishment. In air defense, the AF has successfully executed offensive and defensive counterair to easily defeat aerial threats in each U.S. conflict since WWII. In Korea and Vietnam the U.S. quickly established and maintained air

¹ Merrick E. Krause, *From Theater Missile Defense to Anti-Missile Offensive Actions: A Near-Term Strategic Approach for the USAF* (Maxwell AFB, AL: Air University Press, June 1998), 13. http://www.au.af.mil/au/awc/awcgate/saas/krause_me.pdf (accessed January 15, 2012).

² Richard I. Wolf, *The United States Air Force Basic Document on Roles and Missions* (Washington DC: Office of Air Force History, 1987), 91.

superiority that facilitated the execution of land and air operations.³ In ODS the AFFOR successfully employed deception, jamming, and direct attack to gain air supremacy and defeat an intricate Iraqi air defense system.⁴ In Operations Southern/Northern Watch, in Bosnia and Kosovo, and during OIF the U.S. Air Force quickly dismantled opposing air defenses to establish and maintain air supremacy.⁵ In most of these conflicts air operations were so successful that ground-based air defenses were never employed.

It is in the area of missile defense where service functions debates have most often occurred. In the decade following the 1947 decisions on roles, missions and functions, U.S. strategy was based primarily on a nuclear threat. Based on the Army's belief that it needed capabilities to protect its force from nuclear weapons, it demanded that it become the lead service for surface-based missile defense. The Army also argued that missile defense was a logical extension of its land-based air defense mission. The AF argued that it was already the lead service for offensive missile operations, was the primary strategic arm, and had been given the mission of coordinating all air and missile defenses among the services. Thus, it should also be responsible for surface-based missile defense.⁶

Following the Soviet atomic experiment in 1951, coordinated air missile defense efforts were redoubled. The AF established fifty interceptor squadrons under Air Defense Command and the Army and AF signed an agreement which allowed for an air defense

³ John F. Kries, *Air Warfare and Air Base Air Defense, 1914-1973* (Washington D.C.: Office of Air Force History, 1988), 265.

⁴ Kenneth P. Werrell, *Archie to SAM: A Short Operational History of Ground Based Air Defense* (Maxwell AFB, AL: Air University Press, August, 2005), 223.

⁵ *Ibid.*, 232.

⁶ Warren A. Trest, *Air Force Roles and Missions: A History* (Washington DC: Air Force History Office and Museums Program, 1998), 171-172.

component at each level of the air defense system, gave air defense commanders control of anti-aircraft artillery in their sectors, and formalized rules of engagement.⁷ In 1952 several missile defense points were accepted between the Army and AF. These points were:

Neither service would try to modify the others roles and missions; the terms tactical and strategic would not constitute range; surface-to-air weapons used as either extended or supporting artillery remained the Army's responsibility. The Air Force would not oppose Army development of missiles for low altitude surface-to-air interception; missiles that would replace fighter interceptors were the responsibility of the USAF; and battlefield isolation and interdiction of movement were Air Force functions."⁸

In the era of massive retaliation doctrine and the heated roles and missions environment of the 1950s, both services began developing technological solutions to land-based missile defense. In the late-1950s the Army won this debate and was given overall responsibility for land-based defense while the AF was designated responsibility for area air defense. Secretary of Defense Wilson's ruling emphasized the need for interdependence in executing air and missile defense operations.⁹

To better synchronize unified air missile defense operations in defense of the homeland, Continental Air Command (CONAD) was established. The AF was given executive oversight of CONAD with the Army and Navy establishing component commands. Three years later Canada joined the organization and it was renamed North

⁷ Kenneth Schaffel, *The Emerging Shield: The Air Force and the Evolution of Continental Air Defense, 1945-1960* (Honolulu, HI: University Press of the Pacific, 2011), 115-119.

⁸ Jacob Neufeld, *Ballistic Missiles in the United States Air Force 1945-1960* (Washington DC: Office of Air Force History, 1990), 88.

⁹ Richard I. Wolf, *The United States Air Force Basic Document on Roles and Missions* (Washington DC: Office of Air Force history, 1987), 297-298.

American Air Defense Command (NORAD).¹⁰ However, the Army became unhappy with what it perceived was increasing subordination to AF policy in the air missile defense arena.¹¹

Both the Army and the AF proceeded largely along the directed air and missile defense paths over the next two decades. The Army continued to develop land-based capabilities to employ against a vast Soviet arsenal of ballistic missiles, while the AF focused on offensive missile and offensive counter missile capabilities and coordinating area air defense. Numerous programs were established and implemented in the 1960s and 1970s to synchronize land, air, and sea-based missile defense. However, none of these programs altered the domains in which the services executed missile defense.¹²

In the mid-1970s the Army began development on a weapon-system that would eventually be known as Patriot. Patriot was originally designed to be employed primarily against Soviet fixed- and rotary-wing aircraft.¹³ In 1980 Patriot was modified to attack missiles as well. The initial modification provided only limited anti-missile capability. Thus, in the late-1980s it was further modified and tested. The PAC-2 was fielded just prior to ODS.¹⁴

For all of the successes the U.S. military achieved in ODS, the war did reveal one major vulnerability: missile defense. Iraq possessed rudimentary ballistic missiles referred to as SCUDs. Based on the SCUD threat, multiple Patriot batteries were

¹⁰ Schaffel, *The Emerging Shield: The Air Force and the Evolution of Continental Air Defense, 1945-1960*, 241-254.

¹¹ U.S. Joint Chiefs of Staff. *Countering Air and Missile Threats*. Joint Publication 3-01. Washington DC: Joint Chiefs of Staff, February 5, 2007, p. II-4.

¹² Schaffel, *The Emerging Shield: The Air Force and the Evolution of Continental Air Defense, 1945-1960*, 244-246.

¹³ Werrell, *Archie to SAM: A Short Operational History of Ground Based Air Defense*, 203.

¹⁴ Ibid.

deployed to Saudi Arabia, Israel, and Turkey. Iraq did fire missiles into Saudi Arabia and Israel, and some produced casualties, including the single largest U.S. loss of life in the war.¹⁵ However, the perception was that the Patriots destroyed the vast majority of SCUDs prior to impact. Thus, from a psychological standpoint, the Patriot's performance was a success.¹⁶ In the offensive counter-missile arena, the AF employed over 4,000 sorties, and special operations forces conducted operations, aimed at finding and destroying SCUD launchers. These efforts undoubtedly hampered Iraqi missile operations.¹⁷

Although there were successes in missile defense operations during ODS, there were also major shortcomings. A detailed review of missile defense performance showed that only 30-60% of the SCUDs fired were actually intercepted by Patriots, and despite the massive offensive anti-missile campaign waged by the AF and special operations forces, there was no evidence that mobile SCUD launchers were destroyed.¹⁸

1990-2000s: A New Era in Air Missile Defense

AMD service functions discussions reemerged in the years following ODS. AF Chief of Staff Gen McPeak was particularly outspoken in his belief that each service was employing capabilities in a largely uncoordinated manner. His opinion was that this was creating "seams" that more capable opponents could exploit. Gen McPeak argued that it was time to centrally control all AMD forces under a theater area air defense commander,

¹⁵ Krause, *From Theater Missile Defense to Anti-Missile Offensive Actions: A Near-Term Strategic Approach for the USAF*, 26.

¹⁶ Steve Zappalla, *Joint Theater Missile Defense – An Army Assessment* (Fort Leavenworth KS: U.S. Army Command and General Staff College, 1993), 38-43. <http://www.dtic.mil/dtic/tr/fulltext/u2/a274010.pdf> (accessed January 23, 2012).

¹⁷ Mark L. McGee, *What is the Future of Army Air and Missile Defense?* (Carlisle Barracks, PA: U.S. Army War College, April 7, 2003), 10. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA413590> (accessed January 15, 2012).

¹⁸ Krause, *From Theater Missile Defense to Anti-Missile Offensive Actions: A Near-Term Strategic Approach for the USAF*, 26.

as joint doctrine dictated. He further argued that integrating all AMD forces under the air component was the most effective way of employing joint, unified air missile defense operations.¹⁹

Secretary of the Army Togo West strongly opposed Gen McPeak's argument, instead professing that the Army should remain the foundation for air defense and that ground commanders should control missile defenses.²⁰ Gen McPeak retired shortly after expressing these opinions. New AF leadership seemed more amenable to working within the status quo. However, more coordinated AMD operations were established in the 1990s.²¹

The enduring implication of Iraq's SCUD employment in ODS was that a nation, or armed group, could use a low-technology weapon, possibly with WMD, and pose a real strategic threat to the nation and/or a military threat to U.S. forces. This heightened U.S. efforts on theater missile defense (TMD) and resulted in the Clinton administration raising TMD to its number one defense priority.²² The new TMD strategy focused on three primary programs: Patriot improvement, Navy Aegis improvement, and the Army Theater High Altitude Area Defense (THAAD). The centerpiece of TMD became the Army Patriot. The newest Patriot modification, PAC-3, vastly improved Patriot's range

¹⁹Trest, *Air Force Roles and Missions: A History*, 256.

²⁰ Jason Clashow, and Robert Holzer, "USAF aggressively Guns for Roles," *Defense News* (September 12-18 1994): 1.

²¹ Julie Bird and Vago Muradian, "Oh Lord, its' hard to be humble....," *Air Force Times* (September 12, 1994), 13.

²² Krause, *From Theater Missile Defense to Anti-Missile Offensive Actions: A Near-Term Strategic Approach for the USAF*, 33-38.

and improved the warhead, employing a hit-to-kill warhead.²³ However, expense greatly exceeded expectations and production was reduced by fifty percent.²⁴

To better synchronize joint TMD operations, organizations such as the Joint Theater Air Missile Defense Organization (JTAMDO) were established in the 1990s and given authorities to provide inter-service TMD coordination and develop a Theater Air Missile Defense (TAMD) master plan. Terms like “joint interoperability” and “operational architectures” were used to integrate systems and get beyond the contentious TMD service functions discussions and TMD philosophies of each service.²⁵ Throughout the 1990s, TMD continued to be DOD’s top priority. In 1998, Secretary of Defense Cohen stated in his annual report to the President and Congress, “the U.S. missile defense program places the highest priority on Theater Ballistic Missile Defense (TBMD) and Cruise Missile Defense (CMD) programs to meet today’s threat.”²⁶

The improvements in joint TMD operations and systems in the decade following ODS were manifested by the U.S. performance in OIF. Navy radars detected Iraqi missile launches, passed data through the JFACC battle management, command, control, communications, computers, and intelligence (BMC4I) architecture, to Army Patriot units who successfully destroyed incoming missiles. Of the eleven missile attacks launched by the Iraqis during OIF, all were either destroyed or allowed to impact in unpopulated areas that did not present a threat to coalition forces or local populations.²⁷

²³ Werrell, *Archie to SAM: A Short Operational History of Ground Based Air Defense*, 238-239.

²⁴ *Ibid.*, 240.

²⁵ Krause, *From Theater Missile Defense to Anti-Missile Offensive Actions: A Near-Term Strategic Approach for the USAF*, 28.

²⁶ William S. Cohen, *Annual Report to the President and Congress* (Washington DC: Government Printing Office, 1998), 63.

²⁷ 32nd Army Air and Missile Defense Command, *Operation Iraqi Freedom Theater Air and Missile Defense History* (Fort Bliss, TX: 32nd AAMDC, 2003), 96.

Defensive Fires Analysis

Evaluating U.S. performance in the defensive fires arena is difficult. During each conflict the U.S. has fought in since 1947, it has quickly gained and maintained air superiority. As a result of this, soldiers have fought in Korea, Vietnam, ODS, OEF, and OIF without the threat of enemy air.

In the missile defense arena the only two active combat engagements came in ODS and OIF. In ODS the U.S. performed poorly; in OIF it did well. Based on these criteria alone, the assessment of AMD is very positive. However, does this mean that current service functions and associated joint and service structures bode well for the future?

The problem with missile defense is that many of the most dangerous world actors possess the capability to employ long range missiles, many containing weapons of mass destruction (WMD). A war with North Korea, or other hostile actors who possess missile capabilities, would involve engaging more than eleven rudimentary missiles. In the future the U.S. can expect an increased proliferation of theater missiles (TM). Acquiring these weapons is relatively cheap and the technology is readily available. Analysts believe TMs will be at the heart of adversary anti-access, area denial strategies to prevent the build-up and sustainment of U.S. operations.²⁸

To combat these growing threats new systems are being developed and fielded by the joint force. In the Army, the Medium Extended Air Defense System (MEADS) is a low-to-medium altitude system that employs improved technology and greater mobility,

²⁸ U.S. Joint Chiefs of Staff, *Countering Air and Missile Threats*, Joint Publication 3-01 (Washington DC: Joint Chiefs of Staff, February 5, 2007), I-8.

designed to replace Patriot.²⁹ However, its future is unknown as financial concerns may lead to the program's termination.³⁰ Terminal High Altitude Area Defense (THAAD) is an upper-tier system designed to intercept missiles on their ascending trajectory, or in the outer atmosphere, at greater ranges than Patriot and MEADS.³¹ The Army has currently fielded two THAAD batteries with a goal of fielding nine batteries by FY15.³² Combining these new Army systems with AF fixed-wing OCA and DCA platforms, and Navy AEGIS capabilities, will provide JFCs an even greater Theater Air Missile Defense (TAMD) capability. However, successfully integrating these increasingly complicated systems into coordinated TAMD operations will require even more synchronization and training in the future.

²⁹ Global Security, "Medium Extended Air Defense Systems (MEADS)," Global Security.org, <http://www.globalsecurity.org/space/systems/meads.htm> (accessed January 1, 2012).

³⁰ Missile Defense Advocacy Alliance, "Defense Officials Urge Congress to Fund MEADS Development," Missile Defense Advocacy Alliance, <http://missiledefense.wordpress.com/2011/09/21/defense-officials-urge-congress-to-fund-meads-development/> (accessed January 1, 2012).

³¹ Global Security, "THAAD TM," Global Security.org, <http://www.globalsecurity.org/space/systems/thaad.htm> (accessed January 1, 2012).

³² Lockheed Martin, "THAAD," Lockheed Martin.com, <http://www.lockheedmartin.com/products/thaad/> (accessed January 1, 2012)

CHAPTER 6: JOINT AIR AND MISSILE DEFENSE OPERATIONS

The goal of joint AMD operations is to gain and maintain air superiority, protecting troops on the ground, at sea, and in the air from air and missile threats, allowing each to accomplish specific objectives as directed by JFCs.¹ The original designation of service functions directed each service to provide capabilities that contribute to AMD operations. Thus, a completely joint structure is necessary in order to successfully accomplish this mission. The Navy has a robust air and missile defense structure designed for internal AMD. The maritime component also contributes theater-level radar and missile attack platforms from AEGIS class cruisers and destroyers that are integrated into TAMD.² Their contribution to the TAMD fight is important, and based on its sea-based platform will always remain with the Navy. Thus, we will only discuss Navy involvement on the periphery. The focus of this chapter is how the U.S. currently organizes and fights major, land-based joint AMD operations, and Army and AF contributions to these efforts.

Joint AMD is generally categorized in two areas: offensive counterair (OCA) and defensive counterair (DCA). OCA is defined as:

Offensive operations to destroy, disrupt, or neutralize enemy aircraft, missiles, launch platforms, and their supporting structures and systems both before and after launch, but as close to their source as possible. The goal of OCA operations is to prevent the launch of enemy aircraft and missiles by destroying them and their overall supporting infrastructure prior to employment. This could mean preemptive action against an adversary.³

¹ U.S. Joint Chiefs of Staff, *Countering Air and Missile Threats*, Joint Publication 3-01 (Washington DC: Joint Chiefs of Staff, February 5, 2007), I-2.

² Ibid., I-7.

³ Ibid., I-3.

Offensive counterair is conducted by executing 1) attack operations to defeat enemy air and missile systems, and related infrastructure, on the surface, 2) suppression of enemy air defense (SEAD) to defeat surface-based enemy air defenses through destructive or disruptive means, 3) fighter escort, by employing air-to-air fighters capable of protecting other offensive air platforms, and, 4) fighter sweep to seek out and destroy enemy aircraft or other targets of opportunity in designated areas.⁴

Each service contributes to OCA. OCA is a primary mission of the AF, and the preponderance of attack operations, SEAD, fighter escort and fighter sweep are conducted by AF air-to-ground and air-to-air fighter platforms in most major land-based operations. However, the Navy and Marine Corps also have OCA capability and contribute fighter aircraft to execute each aspect of OCA under JFACC authorities. The Army contributes long-range missile fires in support of attack operations and SEAD, and special operations forces are often involved in OCA.⁵

DCA is defined as:

All defensive measures designed to detect, identify, intercept, and destroy or negate enemy forces attempting to penetrate or attack through friendly airspace. The goal of DCA operations, in concert with OCA operations, is to provide an area from which forces can operate, secure from air and missile threats.⁶

DCA consists of both active and passive measures. Passive measures are all measures taken by the force to reduce the effectiveness of enemy air and missile attacks. Passive measures are employed by all components and include such measures as cover, concealment, dispersion, and deception.⁷ “Active AMD is direct defensive action taken

⁴ Ibid., I-4, 5.

⁵ Ibid., II-5.

⁶ Ibid., I-5.

⁷ Ibid., I-6.

to destroy, nullify, or reduce the effectiveness of air and missile threats against friendly forces and assets.”⁸ Active AMDs involved in DCA include aircraft, electronic attack, surface-to-air missiles, and air defense weapons. As with OCA, DCA is a core function of the AF. The AF provides much of the DCA fighter and electronic attack capability in major land-based operations. However, the Navy possesses the capability to perform maritime DCA, and the Navy and Marines often contribute to JFACC theater DCA operations. The Army’s biggest contribution to DCA is surface-to-air missiles and air defense weapons.⁹

As previously mentioned in Chapter 1, to integrate this vast array of joint capabilities into unified action, JFCs normally appoint the JFACC as the Area Air Defense Commander (AADC). In these duties the JFACC oversees and coordinates all theater air and missile defense (TAMD) operations.¹⁰ The JFACC/AADC commands and controls TAMD operations through an intricate, networked apparatus called battle management, command, control, communications, computers, and intelligence system (BMC4I). The goal of BMC4I “is to integrate the various systems and equipment, including sensors, interceptors, and tactical control centers into a joint theater-wide TMD architecture.”¹¹ BMC4I involves designated cells and specialists who plan and target for attack operations, oversee the execution of OCA and DCA, and dynamically target enemy theater ballistic missile (TBM) capabilities as time sensitive targets (TST).

⁸ Ibid., I-5.

⁹ Ibid., I-6.

¹⁰ Ibid., II-1.

¹¹ Merrick E. Krause, *From Theater Missile Defense to Anti-Missile Offensive Actions: A Near-Term Strategic Approach for the USAF* (Maxwell AFB, AL: Air University Press, June 1998), 55. http://www.au.af.mil/au/awc/awcgate/saas/krause_me.pdf (accessed January 15, 2012).

BMC4I integrates elements from each service component to ensure complete TAMD coverage and integration.¹²

The JFACC/AADC uses all the tools at his/her disposal to develop and execute the theater area air defense plan (AADP). The AADP contains detailed weapons control and weapons engagement procedures for all DCA platforms and is integrated into the theater airspace control plan (ACP).¹³ Besides possessing most of the assets involved in TAMD operations, the JFACC is also usually appointed as the theater airspace control authority (ACA).¹⁴ It is very helpful that the AADC is also the ACA. Having both of these titles allows the JFACC and his JAOC team to fully integrate TAMD into theater airspace operations.

Army Air Missile Defense Command

The most prominent weapon currently in the JFACC's surface-based DCA arsenal is the Army Patriot PAC-3. In the near future, THAAD will provide increased upper-tier capability. The organization that commands and controls theater Patriot/THAAD units is the Army Air Missile Defense Command (AAMDC). The commander of the AAMDC is a brigadier general who serves as an important member of the joint AMD team by executing three critical duties. First, he commands all Army theater-level Patriot/THAAD units. Next, he serves as the theater Army air and missile defense coordinator (TAAMDCOORD). In this role he ensures all JFLCC AMD requirements are met and synchronizes all JFLCC AMD efforts with TAMD operations. Finally, the AAMDC commander is usually appointed as the deputy area air defense commander (DAADC).¹⁵

¹² Ibid.

¹³ JCS *Countering Air and Missile Threats*, JP 3-01, II-10.

¹⁴ Ibid., II-3.

¹⁵ Ibid., II-4.

The JFACC has numerous air component and theater leadership duties. Having a DAADC provides the JFACC a primary agent who is singularly focused on TAMDC operations. In his DAADC role, the AAMDC commander oversees the development of the theater-level Defended Asset List (DAL), assists in the development and execution of the theater AADP, and advises the JFACC/AADC on the proper balance between protecting theater assets and JFLCC formations.¹⁶

The AAMDC brings a robust staff that normally locates in the JAOC and synchronizes operations with the JAOC defensive team led by the senior air defense officer. The AAMDC possesses intelligence personnel focused on collecting intelligence on TBM locations that shape JFACC attack operations and TBM TST operations. They possess operations personnel who command and control Patriot units ensuring they are synchronized with JFACC-led TAMDC operations. Finally, they provide air defense artillery fire control officers (ADAFCO) who provide subject matter expertise to regional/sector air defense commands (RADC/SADC), coordinate Army AMD utilization for use in designated assets/areas on the DAL, and coordinate and track engagement activities for individual Army firing units.¹⁷

Summary

Based on the designated service functions, TAMDC operations are inherently joint. Each service component contributes unique capabilities to the fight that must be synchronized. This is especially true of the Army-AF relationship during major, land-based combat operations. In recent years joint TAMDC operations have become much more synchronized and effective. However, are the assigned service functions and the

¹⁶ Ibid., II-11.

¹⁷ Ibid., II-12.

resulting service structures the optimal way for executing TAMD? Do they optimize the strengths of the Army and AF? The following chapter analyzes these questions more deeply and will begin to formulate an analysis of alternatives.

CHAPTER 7: AIR MISSILE DEFENSE SERVICE FUNCTIONS

Ground-Based Air Missile Defense: Army or Air Force?

As missile defense became more important the Army was able to win service functions arguments, stating that ground-based missile defense was a logical extension of the ground-based air defense mission, and was a capability they required to protect tactical formations. However, in examining today's Army AMD function, do either of these arguments remain valid?

The current AMD function of the Army, as designated by DOD, is to “conduct air and missile defense to support joint campaigns and assist in achieving air superiority.”¹ This function has very little to do with the Army's original stated requirement to provide tactical AMD fires to protect its formations. The truth is that the Army today rarely executes air defense of any type. The AF provides such overwhelming counterair fires that this is rarely necessary. This leaves surface-based missile defense as the Army's primary defensive fires mission.

The current Army systems and organizations do protect tactical ground formations. However, they are primarily operational systems and units, and are largely employed to protect operational and strategic locations/assets. Combat operations over the past twenty years validate this point. During ODS, Patriots were deployed in Saudi Arabia, Israel, and Turkey, not to protect ground forces, but to protect operational/strategic locations such as major population centers, air bases, and ports.²

¹ U.S. Department of Defense, *DOD Directive 5100.01: Functions of the Department of Defense and Its Major Components*, (Washington, DC: Office of the Secretary of Defense, 2010), 30.

² Kenneth P. Werrell, *Archie to SAM: A Short Operational History of Ground Based Air Defense* (Maxwell AFB, AL: Air University Press, August, 2005), 205.

They were employed in much the same manner during OIF, and continue to be employed in this manner today in the Middle East and in Korea.

Although Patriot units, and AAMDCs, do report to JFLCC chains of command at the operational level, the primary agency they integrate operations with is the JFACC, executing theater-level, operational AMD.³ As such, Army AMD operates largely outside the Army organizational structure that is focused primarily on tactical operations. Using Gen McPeak's model of distinct battle areas, Army AMD units operate not in "the close battle for terrain" as does the rest of the Army, but in "the high battle to win air superiority and defend against enemy aircraft and ballistic missile attacks."⁴

Regardless of whether this is categorized in terms of battle areas, or tactical/operational/strategic levels of war, Army AMD units primarily operate in the domain of the AF, executing operational/strategic level defensive fires, under a JFACC-led TAMD structure. This will be increasingly the case as THAAD is introduced into joint operations, adding a ground-based platform capable of attacking missiles in the outer atmosphere. Thus, does it make sense that the Army continues to serve the function of "conducting air and missile defense to support joint campaigns and assist in achieving air superiority?"⁵ If the answer to this question is no, does it make since that ground-based AMD commands and Patriot/THAAD units reside in the Army, vice the AF?

In examining the proper AMD functions, and the resulting service structures, it is useful to use some of the same criteria used in analyzing offensive fires. As was previously noted, service worldviews significantly impact the way each service

³ U.S. Joint Chiefs of Staff, *Countering Air and Missile Threats*, Joint Publication 3-01 (Washington DC: Joint Chiefs of Staff, February 5, 2007), II-11.

⁴ Warren A. Trest, *Air Force Roles and Missions: A History*, (Washington D.C.: Air Force History Office and Museums Program, 1998), 255.

⁵ DOD, *Functions of the Department of Defense and Its Major Components*, DOD Directive, 34.

approaches tactical offensive fires. This often leads to a lack of synchronization and cohesion in planning and executing CAS. Tactical offensive fires are executed with maneuver units that are in close contact with the enemy. Synchronization and cohesion with maneuver units, indirect fires, and rotary wing aircraft are required. However, planning and executing TAMD is different. TAMD is not executed in contact with the enemy, is often coordinated from the JAOC or other AF battle management node, relies on the use of sophisticated equipment and network and sensor architectures that require a great deal of technical training and expertise, and is primarily executed in support of operational/strategic tasks. It is therefore, the opinion of this research, that surface-based TAMD functions are more appropriately aligned with the AF worldview, core competencies, and guiding priorities than with those of the Army.

Air Battle Management/Airspace Control

There are several other reasons that altering current AMD service functions, and subsequent service organizations, might produce more effective TAMD operations. Airspace control and TAMD engagements are coordinated by the principle of air battle management (ABM). ABM seeks “to control the engagement of air targets, ensuring the destruction of enemy aircraft and missiles, while preventing fratricide and unnecessary multiple engagements.”⁶ The highest level of control for Patriot is normally the AF control and reporting center (CRC) and/or airborne warning and control system (AWACS). Thus, Patriot identification authority and engagement authority are usually CRC or AWACS. These AF ABM nodes possess radars that have the ability to acquire

⁶ Department of the Army, *U.S. Army Air and Missile Defense Operations*, FM 44-100 (Washington, DC: U.S. Army, 2000), V-20.

hostile aircraft and missile fire over a larger area, at greater range than a Patriot radar.⁷ Since early acquisition increases the probability of success, full-time Patriot integration into the AF DCA/ABM team would likely improve the effectiveness of TAMMD operations.

Another critical aspect of TAMMD operations is airspace control. Airspace control ensures that AMD operations are coordinated and synchronized with other airspace users. The JFACC, acting as the theater ACA, exercises airspace control through both positive and procedural control. To facilitate the execution of TAMMD fires the ACA establishes procedural airspace coordination measures (ACM) called weapons engagement zones (WEZ). A WEZ is “airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with a particular weapon system.”⁸ WEZs include fighter engagement zones, high- and low-altitude missile engagement zones, short-range air defense engagement zones, and joint engagement zones (JEZ).⁹ JEZs enable both surface-to-air and air-to-air DCA, and is where “multiple air defense weapon systems of one or more service components, simultaneously and in concert, engage enemy airpower in the same airspace.”¹⁰ Since JEZs encompass areas designed for multiple DCA engagements in the same airspace, command and control is vital. Executing operations in a JEZ can be extremely difficult and to be effective, training and coordination is required.¹¹ Incorporating surface-to-air DCA units and platforms into the

⁷ Janell E. Eickhoff, *Service Ownership of the Patriot Missile System: Army or Air Force?* (Fort Leavenworth, KA: Combat Studies Institute Press, June 6, 2003), 43. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA416650> (accessed January 15, 2012).

⁸ JCS, *Countering Air and Missile Threats*, JP 3-01, II-11.

⁹ Ibid.

¹⁰ Ibid., B-B-19.

¹¹ Eickhoff, *Service Ownership of the Patriot Missile System: Army or Air Force?*, 48.

AF DCA/ABM team on a full-time basis would likely enhance the effectiveness of TAMD operations inside these procedural ACMs.

From a unity of effort standpoint, altering the current service functions, and subsequently assigning Patriot/THAAD units to the AF, makes a great deal of sense. However, there are some difficulties associated with these measures. First, Patriot units do provide Army units Corps-level AMD coverage. When executing Corps-level missions, Patriot units normally locate inside the Army area of operations and often are required to re-locate to provide continuous coverage. If Patriots were AF assets, the AF would have to become adept at battlespace management and force protection coordination with the Army. Also field maintenance and logistics would have to be embraced by AF Patriot personnel and units. To be successful would require a change in mindset from the largely fixed-site, airbase mentality of the AF in order to integrate into Army operations.¹² However, these difficulties could be overcome, and do not measure up to the increases in DCA effectiveness that could be attained through a reorganization of service structures.

Many other international militaries agree with this assessment. Ground-based AMD commands and units currently reside in air forces in many advanced militaries. Japan, Germany, Israel, and the Republic of Korea currently place their operational/strategic ground-based AMD units in the AF while leaving tactical-level air defense units in the Army.¹³

¹² Ibid., 39-41.

¹³ Japan Air Self-Defense Force, "Organization: What is JASDF?" Japan Air Self-Defense Force, <http://www.mod.go.jp/asdf/english/formation/index.html> (accessed December 31, 2011); Israeli Defense, "A Revolution in Israel's Air Defense," Israeli Defense, <http://www.israeldefense.com/?CategoryID=472&ArticleID=465> (accessed December 31, 2011); German Culture, "German Air Force Luftwaffe," German Culture,

http://www.germanculture.com.ua/library/facts/bl_air_force.htm (accessed December 31, 2011); Global Security, "ROK Air Force Organization," Global Security.org, <http://www.globalsecurity.org/military/world/rok/rokaf-orbat.htm> (accessed December 31, 2011).

CHAPTER 8: RECOMMENDATIONS

Speaking of the evolving relationship between the Army and AF in synchronizing air-ground operations during OIF, Williamson Murray and MG Robert Scales state in their book “The Iraq War: A Military History:”

The Marines already possessed that symbiosis between air and ground. In fact, a major portion of the Marines’ success in advancing through the central valley between the great rivers was due to their ability to work their air and ground forces as a single team.¹

These quotes are similar to those heard following Korea, in Vietnam, and during our recent campaigns in Iraq and Afghanistan. It is time for the U.S. military to review the lessons of recent history, the success of the Marine Corps, and the highly different worldviews of the Army and AF and adjust service functions and subsequent service organizations to develop a force that can excel in planning and executing all aspects of fires.

Offensive Fires Recommendations

Service Functions

To improve the effectiveness of offensive fires in support of JFCs and component commanders, and better align services with their core competencies and stated visions, the following service function changes are recommended:

1. The author recommends a change from the current DOD Directive 5100.01 Army service function of “conducting prompt and sustained combined arms combat operations on land in all environments and types of terrain, including complex urban environments, in order to defeat enemy ground forces, and seize, occupy, and defend land

¹ Williamson Murray, Robert Scales, *The Iraq War: A Military History* (Cambridge, MA: Harvard University Press, 2003), 181.

areas,”² to “conducting prompt and sustained combined arms combat on land and in the air” The author also proposes that an additional Army function is added stating, “conduct aerial fires in support of forces operating in the close battle area.” DOD Directive 5100.01 is intentionally general and leaves detailed definitions, such as close battle area, to joint doctrine developers to define. In this case, the definition of the close battle area is “within Army/land component boundaries, or short of the FSCL when used.”

2. The AF should continue to perform CAS, but do so as a secondary mission. Under DOD Directive 5001.01 a primary AF function is to “conduct global precision attack, to include strategic attack, interdiction, close air support, and prompt global strike.”³ Strategic attack, interdiction, and prompt global strike align with AF core competencies and stated priorities and should remain primary functions of the AF.

The author recommends that CAS remain an AF function since there are conceivably instances where the nature of combat would require more CAS assets than the Army possesses under this recommended plan. In these instances the AF would be required to augment the Army with CAS assets. This relationship is much the same as the AF CAS relationship with the Marine Corps and the Navy. In daily training and operations the primary AF focus would be on executing strategic and operational missions. If required in time of war, AF pilots would train with Army JTAC/FACs to execute CAS. A more realistic scenario, and one that would likely occur during major combat operations, is a requirement for AI inside the Army AO. AI will always be a core

² U.S. Department of Defense, *DOD Directive 5100.01: Functions of the Department of Defense and Its Major Components*, (Washington, DC: Office of the Secretary of Defense, 2010), 30.

³ Ibid., 34.

AF mission, and could be planned and executed utilizing the existing Theater Air Control System-Army Air Ground System (TACS-AAGS) structure.

Tactical Aerial Fires Army Organizational Changes

To successfully execute tactical aerial fires in support of ground operations the Army requires attack aircraft, the ability to command and control aircraft and airspace operations, and terminal attack controllers. To facilitate the integration of tactical aerial fires inside the Army, a fundamental change in the Army's organization is required.

Organizational recommendations are:

1. Develop an Army air combat element (ACE) at each Corps. The ACE would consist of a command element, fixed- and rotary-wing attack units, and the entire apparatus of air traffic and airspace control necessary for the planning and integration of aerial fires in support of the ground force. Many ACE units would be subordinated down to division level. However, key elements such as Corps-level fixed and rotary-wing attack units, and air traffic control units would remain at the Corps.

2. Assign Army fixed and rotary-wing attack units, and develop and assign, Army air command and control cells to the Army division. Specifically assign a fixed-wing attack squadron and an attack helicopter battalion from the ACE to support division tactical operations. Develop Army air command and control elements and assign them to each division to execute procedural control of aircraft, integrate airspace above the division AO, and integrate air operations with ground maneuver and fires.

3. Develop Army JTACs, TACPs, and FACs and assign them to the maneuver unit they support. Having JTACs, TACPs, and FACs resident in Army units begins the process of establishing cohesion among the tactical air-ground team. Integrating them

with Army fires and rotary-wing aviators in daily training and warfighting operations enables the Army to train and execute tactical air-ground operations and fires on a daily basis. Having aerial fires experts resident in Army units would start the much needed process of educating soldiers and leaders on warfare in the third dimension. This, in turn, would enable Army commanders to take ownership of the aerial battle within their AOs and synchronize it with tactical maneuver and fires.

Assisting and supervising JTACs in terminal control and airspace integration at lower echelons would be Army fixed- and rotary-wing aviators, trained as Forward Air Controllers (FAC). FACs would serve in an actual ground FAC role, be assigned as Air Officers (ALOs) to maneuver battalions, brigades and divisions, and many would be trained as FAC(A)s. This would serve the dual purpose of increasing access to aerial fires throughout the battlefield, and increasing the understanding of air-ground operations in the force.

These recommendations require a major change to Army organizational tables. However, as evidenced by the Army's transformation to a brigade combat team-based, modular force over the past decade, major organizational changes can be executed if they are deemed necessary to enhance future operations.

Force Development/Title 10

To develop the force described above, numerous new organizations, capabilities, facilities, and personnel are required in the Army. In developing this organization, many of these aspects would move from the AF to the Army. Recommendations:

1. Attack Aircraft. Transfer a CAS platform (program) from the AF to the Army. Based on its performance in ODS and its continued excellence in today's conflicts, the A-

10 weapon system satisfies Army tactical aerial fires requirements. Because of its slower speed and longer loiter time it is also ideal for FAC(A) missions. Initially basing would be an issue, as the Army does not possess sufficient runway space to support fixed-wing attack aircraft on many posts. Thus, A-10 squadrons might be required to remain in their current locations. Long-term solutions could involve joint basing or the Army building additional runways and facilities to support A-10s at existing Army installations.

The A-10 is an old airframe which incurs increasing operational costs to maintain. To adequately maintain a tactical fixed-wing fires capability, the Army would need to begin planning for an upgrade or for its replacement. If the A-10 is not the chosen Army fixed-wing fires platform, one would need to be developed.

In establishing a fixed-wing attack capability the Army would also have to establish a fixed-wing pilot training and certification program. Initially the best course of action would be to team with another service to execute this training. In the long-term the Army could develop its own program at locations such as Fort Rucker or Fort Sill.

2. Tactical Air Operations/Terminal Attack Control. Transfer AF JTACs and TACPs from the AF to the Army. This measure involves the Army taking ownership of JTAC education and training. Included in this instruction would be the training of aviators as FACs. Initially the best course of action is for AF JTAC cadre to transfer to the Army, but remain in their current institutional locations. Over time, agreements between the Army and AF would involve transferring ownership of JTAC/FAC institutions or the Army creating its own.

Recommendations 1. and 2. above involve significant Title 10 issues. AF pilots, JTACs, and TACPs joined the AF and are protected from service transfer by Title 10.

Implementing these recommendations would involve programs and agreements between the services, and a phase-in plan for the Army for long-term sustained force development.

3. Airspace Command and Control/Integration. To develop the recommended Army aerial fires structure, air traffic and airspace combat controllers need to be developed by the Army. The Army could initially do this in Marine Corps institutions until it develops its own capability.

Doctrinal Changes

The Army and AF do have broad doctrine that covers the integration of tactical aerial fires in support of the ground force. The AF has very specific doctrine that governs the individual performance of duty for JTACs, TACPs, and ASOCs. However, when compared to the Marine Corps, there is little comprehensive doctrine that facilitates the successful integration of fixed-wing, rotary-wing, and surface-to-surface fires to the degree necessary to successfully form a true air-ground fires team. In order for the Army to successfully assume responsibility for tactical aerial fires, the following doctrinal recommendations are offered:

1. Establish Army doctrine that incorporates rotary-wing attack aviation as a fires platform. The definitions the Army has been using for years of “direct aerial fire support” and “close combat attack” are a ruse to bypass service functions debates. The truth is that Army aviation has been performing CAS since Vietnam. It is time to acknowledge this fact so a cohesive air-ground fires team can be developed and trained in peacetime instead of pieced together in times of conflict. Combining attack helicopters with fixed-wing attack platforms would provide that Army a solid base to execute tactical aerial fires. Under this doctrinal construct Apaches would become the primary CAS platform

with Army fixed-wing attack units augmenting them in the CAS role and executing interdiction short of the FSCL (BAI). A doctrinal construct that incorporates attack aviation as a fires element would enable the Army to combine rotary- and fixed-wing aviation with cannon, rocket, and mortar indirect fires to form an air-ground fires team capable of shaping and influencing the ground commander's entire AO.

2. Establish an overall Army doctrinal construct similar to the Marine Air Command and Control System (MACCS). MACCS covers all aspects of air integration with the ground force that includes organization and functions of the fighter/attack force, airspace command and control, and terminal attack control. MACCS describes in detail how each of these important aspects operates in support of each mission the Marine Air Ground Task Force is required to execute.

3. Establish fidelity in the Army's doctrinal approach to fires throughout its area of operations (AO). This could be done by adopting a measure such as the Marine BCL or by institutionalizing killbox operations. Operating within this battlefield framework Army mortar, cannon, and rotary- and fixed-wing CAS would operate primarily in areas in close contact with the enemy. Army fixed-wing aviation, rocket, and missile fires would execute interdiction missions short of the FSCL, either beyond the BCL or inside open killboxes depending on the type of measure utilized. With the Army's new doctrine of combined arms maneuver/wide area security this level of doctrinal synchronization is required to successfully integrate all aspects of tactical offensive fires in support of increasingly autonomous ground forces.

Defensive Fires Recommendations

Service Functions

The author's single recommendation for defensive fires is that the Army function of "conduct air and missile defense to support joint campaigns and assist in achieving air superiority" be removed.⁴ The current AF function of "conduct offensive and defensive operations, to include appropriate air and missile defense, to gain and maintain air superiority, and air supremacy as required, to enable the conduct of operations by U.S. and allied land, sea, air, space, and special operations forces" is appropriate and covers all aspects of operational/strategic defensive fires.⁵ Removing this Army function would place responsibility for ground-based air and missile defense with the AF.

Ground-Based Air Missile Defense Air Force Organizational Changes

To successfully execute ground-based AMD fires the AF requires ground-based AMD weapon systems, expertise, leadership, and operational integration into the TAMd structure. Organizational changes involved in moving ground-based AMD forces into the AF are much less involved than are organizational change recommendations in the offensive fires arena. New organizations do not need to be created. A transfer of capability from the Army to the AF is required. Specific recommendations include:

1. Transfer Patriot/THAAD units and AAMDCs from the Army to the AF. This provides more AF service control of the OCA/DCA fight and "the high battle to win air superiority and defend against enemy aircraft and ballistic missile attacks."⁶

⁴Ibid., 30.

⁵Ibid., 34.

⁶ Warren A. Trest, *Air Force Roles and Missions: A History*, (Washington D.C.: Air Force History Office and Museums Program, 1998), 255.

2. Align the new AF Air Missile Defense Commands (currently AAMDCs) with each theater JAOC. This provides a full-time AF general officer to manage, not only ground-based AMD systems, but the intricate TAMD system. It also facilitates daily training and coordination by the primary participants in the OCA/DCA fight.

Unfortunately, there are currently only two active AAMDCs and one AAMD (-) (scheduled to become a full-fledged AAMDC in the near future). To fully incorporate this plan the AF would have to grow two more AAMDCs. This would likely entail reducing the size of the existing AAMDCs to create others, or having Patriot theater brigade headquarters perform the DAADC/TAAMDCOORD roles. These are roles Patriot brigade headquarters are staffed and trained to perform.⁷ Regardless of the course of action chosen, this unification of AMD forces would likely increase the capability and level of training and readiness of TAMD operations.

Force Development/Title 10

As with the movement of AF personnel, facilities, and capabilities to the Army in the offensive fires recommendations, these recommendations have their own set of Title 10 implications. These recommendations require changes to AF organizational tables. Implementation would involve programs and agreements between the services, and a phase-in plan for the AF for long-term sustained ground-based AMD force development. As for Patriot institutional instruction, retaining current instructional capacity at Fort Sill until the AF develops its own institutions is a viable option.

Another aspect of surface-based AMD operations that would have to be embraced by the AF is field operations. Patriot units do support land components and Army Corps.

⁷ Department of the Army, *Air Defense Artillery Brigade Operations*, Field Manual 3-01.7 (Washington DC: U.S. Army, February 11, 2010), 1-2.

Thus, they are required to coordinate operating areas with Army headquarters, displace to new locations to provide continuous coverage, execute force protection, and execute resupply and maintenance, often from austere locations in the field. To succeed in covering Army formations, the AF would have to embrace these “field” aspects of Patriot operations. The AF mindset would have to adjust to fully embrace this new mission set. However, a cadre of soldiers from the current Army Patriot program could be retained as part of the AF phase in effort to train new airmen and leaders on the tactical, field tasks associated with Patriot operations.

Proposed Doctrinal Changes

Theater Air and Missile Defense operations are inherently joint and the doctrinal construct is currently sound. Major doctrinal changes would include moving current Army AAMDC and Patriot unit functions into AF doctrine.

Fiscal Implications of Recommendations

Implementing these recommendations will require a realignment of Tables of Allowance and the associated funding streams. This will be especially difficult in the financially challenged environment we are operating in today. However, how much time and money have been spent over the past sixty-four years trying to make the current system work, only to constantly revisit the same discussions that took place in the 1950s? To implement these changes all AF funding associated with tactical fires platforms, JTACs, ASOCs, and other tactical aerial fires forces changing services would be transferred to the Army, while all Army funding associated with ground-based AMD systems and units would be transferred to the AF. Other funding would be required, such as the Army creating a combat controller mission occupation specialty (MOS), and air

traffic control and airspace management capacity. In the short term this would have budget implications for the Army and AF. However, if the U.S. Military desires to rectify the situation created in 1947, and create a true air-ground team that maximizes the core competencies of each service in support of JFCs and subordinate commanders, these are steps that should be taken.

Besides the recommendations espoused in this thesis, there are numerous other, more detailed, organizational, doctrinal, and Title 10 changes and issues that must be addressed in order to bring this plan to fruition. There are also several second and third order effects for the services and for joint force commands that need to be further analyzed and addressed. The scope and limitations of this thesis prevent the author from examining all these details. The recommendations highlighted in this thesis represent the major steps that form the basis for the comprehensive changes in service functions, organizational structure, and doctrinal development required for long-term joint fires improvements.

CONCLUSION

Perhaps it is time to revisit the perspective offered by Gen Merrill McPeak in the 1990s. In offering a conceptual vision, Gen McPeak urged the roles and missions commission to “focus on core competencies” of the service “to produce maximum efficiencies in both warfighting and procurement.”¹ He further stated “each service should retain those assignments that reflect unique strengths with an overall framework that emphasizes the most efficient and effective way to generate and sustain combat capability.”² After determining “what each service’s core business” was, the next step would be to determine how the “resulting service-provided capabilities” should “operate jointly on the modern battlefield.”³

In discussions surrounding service functions, the other services “circled the wagons” and roundly criticized Gen McPeak. As usual service-focused interests and mindsets, and insecurities over losses in funding ruled the day. Thus, service functions remained largely unchanged. Nowhere has this service-centric mindset been more apparent than in the area of fires.

In the offensive fires arena, this means we continue to attempt to pound “a square peg into a round whole” while executing at the tactical level. Tactical air-ground operations in the “close battle area” are not emphasized in AF “core competencies.” Their stated vision and “core business” focus almost entirely on strategic and operational missions. From the outset the AF has stated by their actions, and sometimes with words, that they really don’t want to execute tactical level offensive fires as a primary mission

¹ Warren A. Trest, *Air Force Roles and Missions: A History*, (Washington D.C.: Air Force History Office and Museums Program, 1998), 257.

² Ibid.

³ Ibid.

set. However, from 1947 onward they have largely fought to retain this function based on a fear that if they didn't, the Army would attempt to build its own tactical air force.

As for the Army, initial arguments were focused on obtaining tactical air capabilities. However, as time progressed, the Army largely settled for the current arrangement despite shortcomings on the battlefield. This research shows that on numerous occasions the Army could have altered the current service functions. The decision not to do so was based largely on funding and has resulted in several generations of soldiers believing that fires from the air are AF business. Thus, a lack of knowledge and understanding in fighting in all dimensions of the battlefield has manifested itself within the Army.

The Army can no longer “settle” for the current service fires functions. Its new doctrine of combined arms maneuver (CAM) and wide area security (WAS) requires even greater decentralization and combined arms, air-ground operations.⁴ Coupled with a reduction in field artillery units over the past two decades, this doctrinal shift demands that the Army become more synchronized in the application of indirect, rotary-wing, and fixed-wing tactical fires. History shows that the current Army-AF offensive fires functions and structures will likely not achieve this.

The major problem in the tactical offensive fires relationship between the Army and AF has much less to do with capability than it does with service worldview. This was true in Korea, Vietnam and Desert Storm. It remains true today. The AF is dedicating time and effort into programs like JAGIC to better integrate aerial fires in

⁴ U.S. Army Training and Doctrine Command, *The United States Army Operating Concept 2016-2028*, TRADOC PAM 525-3-1 (Fort Monroe, VA: U.S. Army Training and Doctrine Command, August 19, 2010), 18.

support of the Army. This is a capability that moves the Army and AF in the right direction. However, regardless of the amount of capability applied to the problem, the underlying issue is that the two services have highly different worldviews based on their service cultures. This ultimately affects how the soldier and the airman approach warfighting. All the dedication and additional capabilities in the world are unlikely to change this. The two services have been trying for sixty-four years and still don't have a true air-ground fires team.

In the defensive fires arena, the AF has provided air superiority, and often air supremacy, in each U.S. conflict since 1947. This has relegated the Army's contribution to AMD operations primarily to missile defense. The issue here is much less about service worldview, and more about a better way of conducting warfighting. In recent years, the joint AMD community has vastly improved its performance and capability in executing TAMD. However, the current service functions and resulting service organizations are not the most efficient way to operate. TAMD does not fall in the Army's "core competencies," and moving surface-based AMD to the AF would provide JFACCs a more comprehensive combination of OCA and DCA capabilities that could execute the type of training and establish the level of cohesion required to counter today's AMD threats.

The recommendations presented here are a bold step. It will not happen overnight and will take significant resources to bring to fruition. However, as the joint force evolves to the leaner, more agile force envisioned in Joint Force 2020, it is time to take this step. It is time to align the Army and AF with the fires functions that correspond to their core competencies and worldviews of warfighting. In so doing, a

more comprehensive, capable fires team will be formed in both the offensive and defensive fires arenas.

In order to improve as a joint warfighting community the Armed Forces must refocus and begin looking at fires through a JFC lens instead of through service-centric lenses. The AF is a strategic/operational force. They are good at this; it is their “core competency.” The Army is a largely tactical force that has proven its tactical abilities, once again, during the last ten years of conflict. Let’s apply the strengths of both services to the important joint function of fires to create a structure that facilitates effective joint force operations at all levels.

Bibliography

Books

Bergerson, Frederic. *The Army gets an Air Force: Tactics of Insurgent Bureaucratic Politics*. Baltimore, Maryland: The Johns Hopkins University Press, 1980.

Bourque, Stephen. *Jayhawk! The VII Corps in the Persian Gulf*. Washington DC: Center of Military History, 2002.

Clodfelter, Mark. *The Limits of Air Power*. New York, New York: The Free Press, 1989.

Degen, E.J., Gregory Fontenot, and David Tohn. *On Point: The United States Army in Operation Iraqi Freedom*. Fort Leavenworth, Kansas: Combat Studies Institute Press, 2004.

Field, James A. *History of United States Naval Operations Korea*. Washington DC: Government Printing Office, 1962.

Futrell, Robert F. *The United States Air Force in Korea*. Washington DC: Office of Air Force History, 1983.

Gettleman, Marvin E. *Vietnam: History, Documents, and Opinions on a Major World Crisis*. Greenwich, Connecticut: Fawcett Publications, 1965.

Hallion, Richard P. *The Naval Air War in Korea*. Baltimore, Maryland: The Nautical and Aviation Publishing Company, 1986.

Handel, David P. *The Evolution of United States Air Force Basic Doctrine*. Maxwell Air Force Base, Alabama: U.S. Air University, 1978.

Horwood, Ian. *Interservice Rivalry and Airpower in the Vietnam War*. Fort Leavenworth, Kansas: Combat Studies Institute Press, 2006.

Kries, John F. *Air Warfare and Air Base Defense, 1914-1973*. Washington DC: Office of Air Force History, 1988.

Murray, Williamson and Robert Scales. *The Iraq War: A Military History*. Cambridge, Massachusetts: Harvard University Press, 2003.

Neufeld, Jacob. *Ballistic Missiles in the United States Air Force 1945-1960*. Washington DC: Office of Air Force History, 1990.

Ridgeway, Matthew B., and Harold H. Martin. *Soldier: The Memoirs of Matthew B. Ridgeway*. Westport, Connecticut: Greenwood Publishing Group, 1974.

Sbrega, John. "Southeast Asia," in *Case Studies in the Development of Close Air Support*. Edited by Benjamin F. Cooling. Washington DC: Office of Air Force History, 1990.

Schaffel, Kenneth. *The Emerging Shield: The Air Force and the Evolution of Continental Air Defense*. Honolulu, Hawaii: University Press of the Pacific, 2011.

Smallwood, William L. *Warthog: Flying the A-10 in the Gulf War*. Washington DC: Brassey's Incorporated, 1993.

Trest, Warren A. *Air Force Roles and Missions: A History*. Washington DC: Air Force History Office and Museums Program, 1998.

Warden, John A. *The Air Campaign*. Lincoln, Nebraska: Excel Press, 2000.

Werrell, Kenneth P. *Archie to SAM: A Short Operational History of Ground Based Air Defense*. Maxwell Air Force Base, Alabama: Air University Press, 2005.

Wolf, Richard I. *The United States Air Force: Basic Documents on Roles and Missions*. Washington DC: Air Force History Office and Museums Program, 1987.

Wolk, Herman S. *Planning and Organizing the Postwar Air Force*. Washington DC: Air Force History Office, 2002.

Woodward, Bob. *Bush at War*. New York, New York: Simon and Shuster, 2002.

Military Publications

Air Education and Training Command, *On Learning: The Future of Air Force Education and Training*. Randolph Air Force Base, Texas: Air Education and Training Command, January 30, 2008.

Air Land Sea Application Center. *Kill Box, Multi-Service Tactics, Techniques and Procedures for Killbox Employment*. Air Force Tactics, Techniques, and Procedures 3-2.59. Langley Air Force Base, Virginia: Air Land Sea Application Center, August 2009.

Department of the Army. *Air Defense Artillery Brigade Operations*. Field Manual 3-01.7. Washington DC: Department of the Army, February 11, 2010.

Department of the Army. *Army Aviation Operations*. Field Manual 1-100. Washington DC: Department of the Army, 1997.

Department of the Army. *Aviation Brigades*. Field Manual 3-04.111. Washington DC: Department of the Army, 2003.

Department of the Army. *Battlefield Coordination Detachment*. Field Manual 100-13. Washington DC: Department of the Army, September 5, 1996.

Department of the Army. *Enlisted Promotions and Reductions*. Army Regulations 600-8-19. Washington DC: Department of the Army, December 27, 2011.

Department of the Army. *Fire Support*. Field Manual 3-09. Washington DC: Department of the Army, November 3, 2011.

Department of the Army. *Operational Terms and Graphics*. Field Manual 1-02. Washington DC: Department of the Army, September 2004.

Department of the Army. *Operations*. Field Manual 100-5. Washington DC: Department of the Army, 1976.

Department of the Army. *Operations*. Field Manual 100-5. Washington DC: Department of the Army, 1982.

Department of the Army. *Operations*. Field Manual 3-0. Washington DC: Department of the Army, February 2008.

Department of the Army. *U.S. Army Air and Missile Defense Operations*. Field Manual 44-100. Washington DC: Department of the Army, 2000.

Director U.S. Joint Staff J8. *Joint Close Air Support Action Plan Memorandum of Agreement 2004-02 – Joint Forward Air Controller (Airborne)*. Washington DC: U.S. Joint Staff J8, February 1, 2012.

Director U.S. Joint Staff J8. *Joint Close Air Support Action Plan Memorandum of Agreement 2004-01: Joint Terminal Attack Controller*. Washington DC: U.S. Joint Staff J8, November 1, 2011.

U.S. Air Force. *Air Force Basic Doctrine*. Air Force Doctrine Document 1. Washington DC: U.S. Air Force, October 14, 2011.

U.S. Air Force. *Air Force Basic Doctrine*. Air Force Doctrine Document 2. Washington DC: U.S. Air Force, April 3, 2007.

- U.S. Air Force. *Airman Promotion Program*. Air Force Instruction 36-2502. Washington DC: U.S. Air Force, August 6, 2002.
- U.S. Air Force. *Counterair Operations*. Air Force Doctrine Document 2-1.1. Maxwell Air Force Base, Alabama: LeMay Center for Doctrine Development, October 1, 2008.
- U.S. Air Force. *Counterland Operations*. Air Force Doctrine Document 2-1.3. Maxwell Air Force Base, Alabama: LeMay Center for Doctrine Development, September 11, 2006.
- U.S. Air Force. *Fiscal Year 2011 Air Force Posture Statement*. Washington DC: U.S. Air Force, February 9, 2010.
- U.S. Air Force. *Functions and Basic Doctrine of the United States Air Force*. Air Force Manual 1-1. Washington DC: U.S. Air Force, 1979.
- U.S. Air Force. *Joint Terminal Attack Controller Training Program*. Air Force Instruction 13-112, Volume 1. Washington DC: U.S. Air Force, February 15, 2008.
- U.S. Air Force. *Operation Anaconda: An Air Power Perspective*. Washington DC: U.S. Air Force, February 7, 2005.
- U.S. Air Forces Central. *Operation Iraqi Freedom – By the Numbers*. Shaw Air Force Base, South Carolina: CENTAF Assessment and Analysis Division, April 30, 2003.
- U.S. Army Fires Center of Excellence. *Joint Air Ground Integration Cell White Paper*. Fort Sill, Oklahoma: U.S. Army Fires Center of Excellence, April 1, 2011.
- U.S. Army Training and Doctrine Command. *The United States Army Operating Concept 2016-2028*. Fort Monroe, Virginia: U.S. Army Training and Doctrine Command, August 19, 2010.
- U.S. Army, U.S. Air Force. *Memorandum of Agreement between the United States Army and the United States Air Force for Army/Air Force Liaison Support*. Washington DC: U.S. Army, U.S. Air Force, March 31, 2011.
- U.S. Joint Chiefs of Staff. *Close Air Support*. Joint Publication 3-09.3. Washington DC: U.S. Joint Chiefs of Staff, July 8, 2008.
- U.S. Joint Chiefs of Staff. *Command and Control of Joint Land Operations*. Joint Publication 3-31. Washington DC: U.S. Joint Chiefs of Staff, June 29, 2010.
- U.S. Joint Chiefs of Staff. *Countering Air and Missile Threats*. Joint Publication 3-01. Washington DC: U.S. Joint Chiefs of Staff, February 5, 2007.

U.S. Joint Chiefs of Staff. *Joint Airspace Control*. Joint Publication 3-52. Washington DC: U.S. Joint Chiefs of Staff, May 20, 2010.

U.S. Joint Chiefs of Staff. *Joint Fire Support*. Joint Publication 3-09. Washington DC: U.S. Joint Chiefs of Staff, June 30, 2010.

U.S. Joint Chiefs of Staff. *Joint Interdiction of Follow-On Forces*. Joint Test Publication 3-03.1. Washington DC: U.S. Joint Chiefs of Staff, 1988.

U.S. Marine Corps. *Aviation Operations*. Marine Corps Warfighting Publication 3-2. Washington DC: U.S. Marine Corps, May 9, 2000.

U.S. Marine Corps. *Fire Support Coordination in the Ground Combat Element*. Marine Corps Warfighting Publication 3-16. Quantico, Virginia: Marine Corps Combat Development Center, Doctrine Command, November 28, 2001.

32nd Army Air and Missile Defense Command. *Operation Iraqi Freedom Theater Air and Missile Defense History*. Fort Bliss, Texas: 32nd Air and Missile Defense Command, 2003.

Government Publications

Cohen, William S. *Annual Report to the President and Congress*. Washington DC: Government Printing Office, 1998.

Congressional Research Service. *Military Roles and Missions: A Framework for Review*. Senate Print 95-517. Washington DC: Government Printing Office, 1995.

Crowe, William J. *Roles and Functions of the Armed Force, A Report to the Secretary of Defense*. Washington DC: Office of the Joint Chiefs of Staff, 1989.

U.S. Department of Defense. *DoD Directive 5100.01: Functions of the Department of Defense and Its Major Components*. Washington DC: Office of the Secretary of Defense, 2010.

U.S. Department of Defense. *Quadrennial Roles and Missions Review Report*. Washington DC: Department of Defense, January 2009.

Journal Articles and Papers

Belote, Howard D. "Counterinsurgency Airpower: Air-Ground Integration for the Long War." *Air and Space Power Journal* (Fall 2006): 60.

- Cianciolo, Mark G. "U.S. Army-U.S. Air Force: Can They Fight as a Combined Arms Team?" *Combat Studies Institute Press* (December 17, 1998). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA366201> (accessed January 14, 2012).
- Cupp, Hobby F. "A U.S. Army Formal FAC(A) Program is the Solution for Improving Joint Fires Integration for the Maneuver Commander." *U.S. Air University Press* (February 2009). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA539620> (accessed January 14, 2012).
- D'Amico, Robert J. "Joint Fires Coordination: Service Competencies and Boundary Challenges." *Joint Forces Quarterly*, no. 21 (Spring 1999): 71. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA525517&Location=U2&doc=GetTRDoc.pdf> (accessed January 6, 2012).
- Eickhoff, Janell E. "Service Ownership of the Patriot Missile System: Army or Air Force?" *Combat Studies Institute Press* (June 6, 2003). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA416650> (accessed January 15, 2012).
- Ewing, James W. "An Appraisal of United States Interdiction Doctrine for the Operational Level of War." *U.S. Army Command and General Staff College* (1990). <http://www.dtic.mil/dtic/tr/fulltext/u2/a227382.pdf> (accessed January 7, 2012).
- Farnam, John P. and Lawrence R. Rogers. "Airborne Recon Supported Marines' Advances in Iraq." *U.S. Naval Institute Proceedings* (June 2004): 45.
- Hasken, Scott A. "A Historical Look at Close Air Support." *U.S. Army Command and General Staff College* (2003). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA416360> (accessed January 6, 2012).
- Krause, Merrick E. "From Theater Missile Defense to Anti-Missile Offensive Actions: A Near-Term Strategic Approach for the USAF." *U.S. Air University Press* (June 1998). http://www.au.af.mil/au/awc/awcgate/saas/krause_me.pdf (accessed January 15, 2012).
- Marin, John D. "Misfire: An Operational Critique of Operation Iraqi Freedom (OIF) Targeting Strategy." *U.S. Naval War College* (August 2004). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA465011> (accessed January, 14, 2012).
- McCaffrey, Terrance J. "What happened to BAI? Army and Air Force Battlefield Doctrine Development from Pre-Desert Storm to 2001." *School of Advanced Airpower Studies* (2002). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA420526> (accessed January 7, 2012).
- McCutcheon, Keith B. "Marine Aviation in Vietnam, 1962-1970." *Naval Review* (May 1971): 138.

- McGee, Mark L. "What is the Future of Army Air and Missile Defense?" *U.S. Army War College* (April 7, 2003). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA413590> (accessed January 15, 2012).
- McMahon, Michael J. "The Fire Support Coordination Line – A Concept Behind its Time?" *School of Advance Military Studies* (May 6, 1994). <http://www.dtic.mil/dtic/tr/fulltext/u2/a284631.pdf> (accessed January 21, 2012).
- Murray, Williamson. "Air Power in the Gulf: The Limits of Air Power." *Selected Reading Part III, Volume I, U.S. Naval War College* (August 2004): 3.
- Neubauer, Kenneth P. "Operational Leadership in Air Warfare: A Study of the Battle of Britain and Operation Desert Storm." *Naval University Press* (1994). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA279588> (accessed January 24, 2012).
- Novotny, Robert. "Defining Operational Fires." *U.S. Naval War College* (February 13, 2006). <http://www.dtic.mil/cgibin/GetTRDoc?AD=ADA463900&Location=U2&doc=GetTRDoc.pdf> (accessed January 6, 2012).
- Olson, Robert A. "Air Mobility for the Army." *Journal of Military History*, vol. 28, no. 4 (1965): 169.
- Roberts, Ross L. "Ground Truth: The Implications of Joint Interdependence for Air and Ground Operations." *U.S. Air University* (March 2006). <http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA463466> (accessed January 14, 2012).
- Sando, Donald M. "Band of Brothers – Warrior Ethos, Unit Effectiveness and the Role of Initial Entry Training." *U.S. Army War College* (May 3, 2004). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ada424011> (accessed January 14, 2012).
- Skinner, Douglas W. "AirLand Battle Doctrine." *Center for Naval Analysis* (September 1998). <http://www.panzertruppen.org/2011/militar/mh032.pdf> (accessed February 10, 2012).
- Smith, Kenneth A. "Joint Transformation of Aerial Interdiction by Enhancing Killbox Operations." *U.S. Air University Press* (April 2006). <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA475658> (accessed January 22, 2012).
- Zappalla, Steve. "Joint Theater Missile Defense – An Army Assessment." *Command and General Staff College* (1993). <http://www.dtic.mil/dtic/tr/fulltext/u2/a274010.pdf> (accessed January 23, 2012).

Magazine Articles

- Bird, Julie and Vago Muradian. "Oh Lord, It's Hard to be Humble..." *Air Force Times* (September 12, 1994): 13.

Clashow, Jason and Robert Holzer. "USAF aggressively Guns for Roles." *Defense News* (September 12-18, 1994): 1.

Fastabend, David A., and Robert H. Simpson. "Adapt or Die: The Imperative for a Culture of Innovation in the United States Army." *AUSA.org*. February 2004.
<http://www.ausa.org/publications/armymagazine/archive/2004/2/Pages/default.aspx>
(accessed January 14, 2012).

McElroy, Robert H., and Patricia S. Hollis, interview with MG Franklin L. Hagenback. "Fire Support for Operation Anaconda." *Field Artillery Journal* (September-October 2002): 7.

Steele, Dennis. "America's Army: The Strength of the Nation." *AUSA.org*. December 2008.
http://www.ausa.org/publications/armymagazine/archive/2008/12/Documents/Steele_Meeting_1208.pdf
http://www.ausa.org/publications/armymagazine/archive/2008/12/Documents/Steele_Meeting_1208.pdf (accessed December 30, 2011).

Tirpak, John A. "Struggling to Cover Commitments." *Air Force-Magazine.com*. September 2010. <http://www.airforce-magazine.com/MagazineArchive/Pages/2010/September%202010/0910commit.aspx>; (accessed December 31, 2011).

Vessey, William. "Combined Arms in the CAS Firefight." *Air Land Sea Bulletin* (March 2010): 12.

Website

German Culture. "German Air Force Luftwaffe." German Culture.
http://www.germanculture.com.ua/library/facts/bl_air_force.htm (accessed December 31, 2011).

Global Security. "Airborne Laser Testbed." Global Security.
http://www.germanculture.com.ua/library/facts/bl_air_force.htm (accessed December 31, 2011).

Global Security. "Medium Extended Air Defense Systems (MEADS)." Global Security.
<http://www.globalsecurity.org/space/systems/meads.htm> (accessed January 1, 2012).

Global Security. "ROK Air Force Organization." Global Security.
<http://www.globalsecurity.org/space/systems/meads.htm> (accessed January 1, 2012).

Global Security. "THAAD TM." Global Security.
<http://www.globalsecurity.org/space/systems/meads.htm> (accessed January 1, 2012).

- Israeli Defense. "A Revolution in Israel's Air Defense." Israeli Defense.
<http://www.israeldefense.com/?CategoryID=472&ArticleID=465> (accessed December 31, 2011).
- Japan Air Self-Defense Force. "Organization: What is JASDF?" Japan Self-Defense Force.
<http://www.israeldefense.com/?CategoryID=472&ArticleID=465> (accessed December 31, 2011).
- Lockheed Martin. "THAAD." Lockheed Martin.
<http://www.israeldefense.com/?CategoryID=472&ArticleID=465> (accessed December 31, 2011).
- Marines. "The Birth of Marine Corps Aviation." Marines.
http://www.marines.com/main/index/winning_battles/history/innovations/first_marine_aviation (accessed on January 5, 2012).
- Missile Defense Advocacy Alliance. "Defense Officials Urge Congress to Fund MEADS Development." Missile Defense Advocacy Alliance.
<http://missiledefense.wordpress.com/2011/09/21/defense-officials-urge-congress-to-fund-meads-development/> (accessed January 1, 2012).
- U.S. Air Force. "Our Mission." U.S. Air Force.
<http://www.airforce.com/learn-about/our-mission/> (accessed January 14, 2012).
- U.S. Army. "Stand-To! Edition: January 7, 2011." U.S. Army.
<http://www.airforce.com/learn-about/our-mission/> (accessed January 14, 2012).
- Correspondence
- James Lowe, email to author, February 1, 2012.
- Sean Bateman, email to author, January 29, 2012.
- Roy Sevalia, email to author, February 20, 2012.
- John Drago, Memorandum for Commander, Fires Center of Excellence reference Excalibur use in Afghanistan, March 10, 2011.

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